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Pen and Ink Changes to NIOSH Pocket Guide to Chemical Hazards

Please make the following corrections in this publication:

Page 15	*CHANGE* 30 CFR 1111.1405-5 ***TO*** 30 CFR 11.1405-5
Page 23	*CHANGE* SA.....Supplied air-purifying respirator ***TO*** SA.....Supplied-air respirator
Page 207	*ADD* Silica (crystalline) to the bottom of the page

When requesting additional copies or information regarding this publication, please reference this Fifth Printing as DHHS (NIOSH) Publication No. 85-114.

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NIOSH POCKET GUIDE TO CHEMICAL HAZARDS

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Institute for Occupational Safety and Health

September 1985

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Also, thanks are due to those individuals who reviewed and constructively commented on this Pocket Guide during its development.

PREFACE

The Pocket Guide to Chemical Hazards presents information taken, in part, from the NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards. The information is presented in a tabular format for ease and convenient use as a quick reference source relating to general industrial hygiene and medical surveillance practices. The information contained in this Pocket Guide includes: chemical names and synonyms, exposure limits and recommendations, chemical and physical properties, analytical methods, respiratory and personal protective equipment recommendations, signs and symptoms of exposure, and procedures for emergency treatment.

The information assembled for the original printing was the result of an effort undertaken jointly by the National Institute for Occupational Safety and Health (NIOSH) and the Department of Labor (DOL) to develop supplemental requirements for approximately 400 workplace environmental exposure standards adopted by the Occupational Safety and Health Administration (OSHA) in 1971. The information was set forth in draft technical standards which were transmitted to OSHA in rule making.

The fifth printing of the Pocket Guide represents the efforts of NIOSH and includes addition of the following substances: arsenic, asbestos, beryllium, vinyl chloride, and thirteen carcinogens for which standards were promulgated by OSHA in 1974. Also included are revisions in respirator selection for each chemical, an update of NIOSH and the American Conference of Governmental Industrial Hygienists (ACGIH) exposure recommendations, and where identified, a notation of the appropriate Chemical Abstract Service (CAS), Registry of Toxic Effects and Chemical Substances (RTECS), and U.S. Department of Transportation (DOT) numbers for each chemical.

Since the draft technical standards were written in a legal format, this Pocket Guide was developed as a vehicle for making the technical information contained in those draft standards more conveniently available to workers, employers, and occupational health professionals.

I. INTRODUCTION

This Pocket Guide to Chemical Hazards is presented as a source of general industrial hygiene and medical surveillance information for workers, employers, and occupational health professionals. The Pocket Guide does not attempt to present all pertinent data. Rather, it presents key information and data in an abbreviated tabular format for 397 individual chemicals or chemical types (e.g., cyanides, arsenic and compounds, etc.) found in the work environment and for which there are specific Federal regulations. The implementation of the industrial hygiene and medical surveillance practices recommended in this Pocket Guide will assist in initiating and maintaining effective occupational health programs for the protection of workers.

Background

The National Institute for Occupational Safety and Health (NIOSH), which is responsible for undertaking research and developing recommended health and safety standards, joined together in 1974 with the Occupational Safety and Health Administration (OSHA), whose jurisdictions relate to promulgation and enforcement activities, to develop a series of complete occupational health standards for those substances with existing permissible exposure limits (PEL's). This joint effort, labeled the Standards Completion Program (SCP), involved the cooperative efforts of several contractors and personnel from various Divisions within both NIOSH and OSHA. The output from this program included approximately 400 substance-specific draft standards and supporting documentation which contained technical information and recommendations needed for the promulgation of new occupational health regulations.

Thus, an extensive data base of information useful to the entire occupational health community and the worker was developed. This information is updated periodically to reflect new data regarding the toxicity of the substance and any changes made in exposure standards or recommendations.

Data Collection and Application

The data collected for this revision were derived from a variety of sources, including NIOSH Criteria Documents, Current Intelligence Bulletins, Special Hazard Reviews, and Occupational Hazard Assessments; recognized textbooks in the fields of industrial hygiene, medicine, toxicology, and analytical chemistry; and articles from a variety of technical journals.

II. NIOSH RECOMMENDATIONS

Acting under the authority of the Occupational Safety and Health Act of 1970 (Public Law 91-596), NIOSH develops and periodically revises recommendations or limits of exposure to potentially hazardous substances or conditions in the workplace. It also recommends appropriate preventive measures designed to reduce or eliminate adverse health effects of these hazards. To formulate these recommendations, NIOSH evaluates all known and available medical, biological, engineering, chemical, trade, and other information relevant to the potential hazard. These recommendations are then published and transmitted to OSHA and the Mine Safety and Health Administration (MSHA) for use in promulgating legal standards.

NIOSH recommendations are published in a variety of documents. Criteria Documents recommend workplace exposure limits and/or appropriate preventive measures designed to reduce or eliminate adverse health effects.

Current Intelligence Bulletins are based on the evaluation of new information on a particular hazard in light of previously known toxicology, production, and use data. The data contained therein are a prompt review and evaluation of information received by NIOSH on occupational hazards that are either unrecognized or greater than generally known.

Special Hazard Reviews, Occupational Hazard Assessments, and Technical Guidelines support and complement the other standards development activities of the Institute. Their purpose is to assess, from a safety and health standpoint, specific problems associated with a given agent or hazard such as a potential for injury or for carcinogenic, mutagenic, or teratogenic effects, and to recommend appropriate control and surveillance methods. Although they are not intended to supplant the more comprehensive criteria documents, they are prepared in such a way as to assist OSHA or MSHA in the formulation of regulations.

Besides the aforementioned publications, NIOSH also periodically presents testimony before various Congressional committees and at OSHA rule-making hearings.

The intent of the following table is to provide, in rapid-reference form, a list of those substances and conditions for which NIOSH has made recommendations and the dates of their transmittal or testimony to OSHA. Unless otherwise noted in the table, the recommendations are published in criteria documents.

POTENTIALLY HAZARDOUS SUBSTANCES OR CONDITIONS EVALUATED BY NIOSH THROUGH 1985

Hazard	Date of Completion
2-Acetylaminofluorene	September 1973 as part of NIOSH testimony at OSHA hearing
Acetylene	July 1976
Acrylamide	October 1976
Acrylonitrile	September 1977; revised March 1978 as part of NIOSH testimony at OSHA hearing
Aldrin/dieldrin (Special Hazard Review)	September 1978
Alkanes (C5-C8)	March 1977
Allyl chloride	September 1976
4-Aminodiphenyl	September 1973 as part of NIOSH testimony at OSHA hearing
Ammonia	July 1974
Animal rendering processes	March 1981
Antimony and compounds	September 1978
Arsenic, inorganic	September 1974; revised June 1975; reaffirmed July 1982 as part of NIOSH testimony at OSHA hearing
Arsine (CIB)	August 1979
Asbestos	January 1972; revised September 1976; revised March 1984 as part of NIOSH testimony at Congressional

POTENTIALLY HAZARDOUS SUBSTANCES OR CONDITIONS EVALUATED BY NIOSH THROUGH 1985—Continued

Hazard	Date of Completion
Asbestos (continued)	hearing; reaffirmed June 1984 as NIOSH testimony at OSHA hearing
Asphalt fumes	September 1977
Benzene	July 1974; revised August 1976; revised July 1977 as part of NIOSH testimony at OSHA hearing
Benzidene-based dyes (Special Hazard Review)	November 1979; reaffirmed January 1983
Benzidine	September 1973 as part of NIOSH testimony at OSHA hearing
Benzoyl peroxide	June 1977
Benzyl chloride	August 1978
Beryllium	June 1972; revised August 1977 as part of NIOSH testimony at OSHA hearing
Boron trifluoride	December 1976
1,3-Butadiene (CIB)	February 1984
Cadmium	August 1976; revised September 1984 in CIB
Carbaryl	September 1976
Carbon black	September 1978
Carbon dioxide	August 1976

POTENTIALLY HAZARDOUS SUBSTANCES OR CONDITIONS EVALUATED BY NIOSH THROUGH 1985—Continued

Hazard	Date of Completion
Carbon disulfide	May 1977
Carbon monoxide	August 1972
Carbon tetrachloride	December 1975; revised June 1979
Chlorine	May 1976
Chloroform	September 1976; revised June 1976
bis-Chloromethyl ether	September 1973 as part of NIOSH testimony at OSHA hearing
Chloromethyl methyl ether	See Methyl chloromethyl ether
Chloroprene	August 1977
Chromic acid	July 1973; revised December 1975 (see Chromium (VI))
Chromium (VI)	December 1975
Chrysene (Special Hazard Review)	June 1978
Coal gasification plants	September 1978
Coal liquefaction, Volumes I and II (Occupational Hazard Assessment)	June 1981
Coal-tar products	September 1977
Cobalt (Occupational Hazard Assessment)	November 1981

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HE 20.7108:

POTENTIALLY HAZARDOUS SUBSTANCES OR CONDITIONS EVALUATED BY NIOSH THROUGH 1985—Continued

Hazard	Date of Completion
Coke oven emissions	February 1973; revised November 1975 as part of NIOSH testimony at OSHA hearing
Confined spaces, working in	December 1979
Cotton dust	September 1974; reaffirmed September 1983 as part of NIOSH testimony at OSHA hearing
Cresol	February 1978
Cyanide, hydrogen and cyanide salts	March 1977
DDT (Special Hazard Review)	September 1978
2,4-Diaminoanisole and its salts (CIB)	January 1978
Dibromochloropropane	September 1977
3,3′-Dichlorobenzidine	September 1973; as part of NIOSH testimony at OSHA hearing
Diisocyanates	September 1978
4-Dimethylaminoazobenzene	September 1973; as part of NIOSH testimony at OHSA hearing
Dinitro-ortho-cresol	February 1978
Dinitrotoluene (CIB)	July 1985
Dioxane	January 1984

POTENTIALLY HAZARDOUS SUBSTANCES OR CONDITIONS EVALUATED BY NIOSH THROUGH 1985—Continued

Hazard	Date of Completion
Dioxin (see 2,3,7,8-TCDD)(CIB)	January 1984
Di-2-ethylhexyl phthalate (DEHP)(Special Hazard Review)	March 1983
Elevated workstations, emergency egress from	December 1975
Epichlorohydrin	September 1976; revised October 1978 in CIB
Ethylene dibromide	August 1977; revised November 1983; reaffirmed February 1984 as part of NIOSH testimony at OSHA hearing
Ethylene dichloride	March 1976; revised April 1978 in CIB; revised September 1978
Ethyleneimine	September 1973; as part of NIOSH testimony at OSHA hearing
Ethylene oxide (Special Hazard Review)	September 1977; revised July 1983 as part of NIOSH testimony at OSHA hearing
Ethylene thiourea (Special Hazard Review)	October 1978
Excavations, development of draft construction safety standards for	May 1983; Technical Guideline
Fibrous glass	April 1977
Fluorides, inorganic	June 1975
Fluorocarbon polymers, decomposition products	September 1977
Formaldehyde	December 1976; revised April 1981 in CIB

POTENTIALLY HAZARDOUS SUBSTANCES OR CONDITIONS EVALUATED BY NIOSH THROUGH 1985—Continued

Hazard	Date of Completion
Furfuryl alcohol	March 1979
Glycidyl ethers	June 1978
Glycol ethers (CIB)	May 1983
Grain elevators and feed mills, occupational safety in (Technical Guideline)	September 1983; reaffirmed June 1984 as part of NIOSH testimony at OSHA hearing
Hot environments	June 1972
Hydrazines	June 1978
Hydrogen fluoride	March 1976
Hydrogen sulfide	May 1977
Hydroquinone	April 1978
Identification system for occupationally hazardous materials	December 1974
Isopropyl alcohol	March 1976
Kepone	January 1976
Ketones	June 1978
Land-based oil and gas well drilling, comprehensive safety recommendations for (Technical Guideline)	September 1983
Lead, inorganic	January 1973; revised March 1977 as part of NIOSH testimony at OSHA hearing

POTENTIALLY HAZARDOUS SUBSTANCES OR CONDITIONS EVALUATED BY NIOSH THROUGH 1985—Continued

Hazard	Date of Completion
Lockout/tagout, guidelines for controlling hazardous energy during maintenance and servicing (Technical Guideline)	September 1983
Logging from felling to first haul	July 1976
Malathion	June 1976
Mercury, inorganic	August 1973
Methyl alcohol	March 1976
Methyl chloromethyl ether	September 1973; as part of NIOSH testimony at OSHA hearing
Methyl parathion	September 1976
4,4'-Methylenebis (2-chloroaniline)(MOCA) (Special Hazard Review)	September 1978
Methylene chloride	March 1976
Monohalomethanes (CIB)	September 1984
alpha-Naphthylamine	September 1973; as part of NIOSH testimony at OSHA hearing
beta-Naphthylamine	September 1973; as part of NIOSH testimony at OSHA hearing
Niax® Catalyst ESN (Joint NIOSH/OSHA CIB)	May 1978

POTENTIALLY HAZARDOUS SUBSTANCES OR CONDITIONS EVALUATED BY NIOSH THROUGH 1985—Continued

Hazard	Date of Completion
Nickel carbonyl (Special Hazard Review)	May 1977
Nickel, inorganic and compounds	May 1977
Nitric acid	March 1976
Nitriles	September 1978
4-Nitrobiphenyl	September 1973; as part of NIOSH testimony at OSHA hearing
Nitrogen oxides	March 1976
Nitroglycerin; ethylene gylcol dinitrate (EGDN)	June 1978
2-Nitropropane (CIB)	April 1977; revised October 1980 in Joint OSHA/NIOSH Health Hazard Alert
N-Nitrosodimethylamine	September 1973; as part of NIOSH testimony at OSHA hearing
Noise	August 1972
Organotin compounds	November 1976
Paint and allied coating products, manufacture of	September 1984
Parathion	July 1976
Pesticide manufacturing and formulation	July 1978
Phenol	July 1976
Phenyl-beta-naphthylamine (CIB)	December 1976

POTENTIALLY HAZARDOUS SUBSTANCES OR CONDITIONS EVALUATED BY NIOSH THROUGH 1985—Continued

Hazard	Date of Completion
Phosgene	February 1976
Polychlorinated biphenyls	September 1977
Precast concrete products industry, comprehensive safety recommendations for (Technical Guideline)	June 1984
beta-Propiolactone	September 1973 as part of NIOSH testimony at OSHA hearing
Refined petroleum solvents	July 1977
Silica, crystalline	November 1974
Sodium hydroxide	September 1975
Styrene	September 1983
Sulfur dioxide	February 1974; revised May 1977 as part of NIOSH testimony at OSHA hearing
Sulfuric acid	June 1974
2,3,7,8-TCDD (CIB)	January 1984
1,1,2,2-Tetrachloroethane	December 1976; revised August 1978 in CIB
Tetrachloroethylene	July 1976; revised January 1978 in CIB
Thiols: n-alkane mono, cyclohexane, and benzene	September 1978
o-Tolidine	August 1978

POTENTIALLY HAZARDOUS SUBSTANCES OR CONDITIONS EVALUATED BY NIOSH THROUGH 1985—Continued

Hazard	Date of Completion
Toluene	January 1974
Toluene diisocyanate	July 1973; revised September 1978 (see Diisocyanates)
1,1,1-Trichloroethane	July 1976
Trichloroethylene	July 1973; revised February 1978 in Special Hazard Review
1,1,2-Trichloroethane (CIB)	August 1978
Trimellitic anhydride (CIB)	February 1978
Tungsten and cemented tungsten carbide	September 1977
Ultraviolet radiation	December 1972
Vanadium	August 1977
Vibration Syndrome (CIB)	March 1983
Vinyl acetate	September 1978
Vinyl chloride	March 1974; reaffirmed June 1974 as part of NIOSH testimony at OSHA hearing
Vinyl halides	September 1978
Waste anesthetic gases and vapors	May 1977
Xylene	May 1975
Zinc oxide	October 1975

III. HOW TO USE THIS POCKET GUIDE

This Pocket Guide has been designed as a pocket-sized publication that can be utilized to provide chemical-specific data to supplement general industrial hygiene knowledge. In order to maximize the amount of data provided within a limited amount of space, extensive use has been made of abbreviations and symbolic codes. Discussed in the following sections are the codes and abbreviations used in this Pocket Guide.

Chemical Name and Formula

The chemical name given is usually that found in 29 CFR 1910, Subpart Z, General Industry Standards for Toxic and Hazardous Substances (OSHA). The chemical formula is also provided.

Below the chemical formula is the Chemical Abstract Service (CAS) registry number. This number, in the format xxx-xx-x, is unique for each chemical and allows more efficient searching on other data bases such as the Chemical Substances Information Network (CSIN).

Also included is the NIOSH Registry of Toxic Effects of Chemical Substances (RTECS) number, in the format ABxxxxxxx. RTECS may be useful in obtaining additional information on a chemical.

Under the RTECS number, the U.S. Department of Transportation (DOT) UN or NA identification number and the corresponding guide number have been placed. Their format is xxxx xx and indicates that the chemical is regulated by DOT. The guide number (xx) refers to actions to be taken to stabilize an emergency situation. This information can be found in the DOT Hazardous Materials Emergency Response Guidebook, DOT P5800.3.

Synonyms

Several common synonyms, if any, are listed for each chemical in this column.

Exposure Limits

The permissible exposure limit (PEL), as found in 29 CFR 1910, Subpart Z, General Industry Standards for Toxic and Hazardous Substances as of March 11, 1984, is listed first. Unless noted otherwise, exposure limits are 8-hour time-weighted average (TWA) concentrations. OSHA ceiling concentrations shall not be exceeded at any time, unless noted otherwise.

For chemicals which NIOSH has published recommendations, the NIOSH recommended exposure limits (REL's) (i.e., 8- or 10-hour TWA and/or ceiling) are also noted.

The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value® (TLVs®) are also noted. ACGIH ceiling concentrations should not be exceeded even instantaneously. In addition, the ACGIH designates certain substances that have been proven carcinogenic in man. Carcinogenic substances for which a TLV has been assigned are listed as A1a and those for which environmental conditions have not been sufficiently defined to assign a TLV are listed as A1b. Those chemicals suspected by ACGIH of having carcinogenic potential for man are designated as A2. Where appropriate, the ACGIH TLV's listed will be designated A1a, A1b, or A2. The ACGIH TLV's for 1985-86 are utilized in this revision of the Pocket Guide.

IDLH Level

The Immediately Dangerous to Life or Health (IDLH) level defined by the SCP for the purpose of respirator selection is listed in either ppm or mg/m^3. This level represents a maximum concentration from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects. Where the notation 'Ca' appears, NIOSH has recommended that the substance be treated as a potential human carcinogen.

Physical Description

A brief description of the appearance and odor of each substance is provided.

Chemical and Physical Properties

A number of important chemical and physical properties are given for each substance:

MW: Molecular weight

BP: Boiling point at 1 atm*, °F

Sol: Solubility in water, g/100g water at 20°C*

FL.P: Flash point, closed cup, °F (or open cup if annotated (oc)) vapor pressure at 20°C*, mmHg

MP: Melting point, °F

UEL: Upper explosive limit in air, % by volume

LEL: Lower explosive limit in air, % by volume

IP: Ionization Potential, eV

MEC: Minimum explosive concentration for a dust in air, g/l

*If so noted after a specific entry, these properties may be reported at other conditions.

Incompatibilities

Potentially hazardous incompatibilities of each substance are listed.

Measurement Method

A brief, key word description of the suggested sampling and analytical method is provided. Each description is comprised of four components: (1) collection, (2) work-up, (3) analysis, and (4) the set code for ordering a description of the analytical method. The codes employed are listed in Table 1a.

Where the annotation 'NIOSH xx-xxx' or 'III' appears, a measurement method has been published in the 'NIOSH Manual of Analytical Methods, 2nd or 3rd Editions' which is available from the U.S. Government Printing Office, Washington, D.C. 20402.

For other methods appearing in this Pocket Guide, a full description may be found in the 'NIOSH Analytical Methods from the Standards Completion Program' series of publications, available from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161. The NTIS publication number and the set code for each chemical are found in Table 1b. Where a dash appears in this column, no method has been suggested by NIOSH.

Personal Protection and Sanitation

A summary of recommended practices specific to each toxic substance is presented. These recommendations supplement general work practices (e.g., no eating where chemicals are used).

There are five primary categories of information, each of which refers to a recommended work practice when handling each substance, and a final category ('PROVIDE') for any item special to that substance.

CLOTHING: Personal protective clothing use.

GOGGLES: Eye protection use.

WASH: Cleaning spilled chemical from the body (supplements normal washing before eating, etc.).

CHANGE: Routine changing of work clothing.

REMOVE: Frequency and immediacy of clothing removal upon accidental contamination.

PROVIDE: Information specific for a substance such as providing quick drench facilities (e.g., emergency showers) and facilities for the emergency washing of the eyes.

Table 2 lists the definition of the codes used.

Respirator Selection

A condensed table of allowable respiratory use is provided. For each line a maximum use concentration (in ppm, mg/m^3, μg/m^3, fibers/m^3, or mppcf) condition (e.g., escape) followed by a series of codes representing classes of respirators is listed. Individual respirator codes are separated by slanted lines (/). For each maximum use concentration, only those respirators with the minimum required protection factor and meeting other use restrictions based on the NIOSH decision logic, are listed. All recommended respirators of a given class, can be utilized at any concentration equal to or less than the class's listed maximum use concentration. Respirator selection should follow recommendations that provide the greatest degree of protection.

In this Pocket Guide, single use respirators refer to those disposable-type respirators which have only been tested under provisions of 30 CFR 1111.140-5 for which a fivefold protection factor has been established. To determine if certain single-use respirators can be used in other applications, including a higher protection factor, consult the NIOSH (DHHS-NIOSH Publication No. 85-101) to identify the conditions under which they may be used. If a higher protection factor is utilized, the wearer must first be properly fitted with a respirator using either a quantitative fit test or an "improved" qualitative fit test as accepted in the OSHA lead standard. Respirator selection recommendations are based on the NIOSH REL's. For a chemical where no REL exists, recommendations are based on meeting the OSHA PEL's except where the ACGIH TLV for the chemical is lower.

All respirators selected should be approved by NIOSH and the Mine Safety and Health Administration (MSHA). Pesticides are not identified as such in the respirator selection tables. For those substances that are pesticides, the recommended air-purifying respirator must be specifically approved by NIOSH/MSHA.

Additionally, a complete respirator protection program should be implemented including all requirements in 29 CFR 1910.134. At a minimum, a respirator protection program should include regular training, fit-testing, periodic environmental monitoring, maintenance inspection, and cleaning. The selection of the actual respirator to be used within the classes of recommended respirators depends on the particular use situation, and should only be made by a knowledgeable person. REMEMBER, air-purifying respirators will not protect from oxygen-deficient atmospheres. For firefighting, only self-contained breathing apparatuses with full facepieces operated in pressure-demand or other positive pressure modes are recommended for all chemicals in the Pocket Guide.

Codes employed for the various categories of respirators are defined in Table 3.

Route of Health Hazard

The toxicologically important routes of entry for each substance are listed. Abbreviations given are:

Inh	Inhalation
Abs	Skin absorption
Ing	Ingestion
Con	Skin and/or eye contact

Symptoms

Potential symptoms as a result of exposure, and their respective abbreviations are defined in Table 4.

First Aid

First aid procedures are listed for response to eye and skin contact, inhalation, and ingestion of the toxic substance. Abbreviations are defined in Table 5.

Target Organs

The organs which are affected by exposure to each substance are listed.

Table 1a
CODES FOR MEASUREMENT METHODS

COLLECTION

Ads	Adsorption tube
Bag	Gas collection bag
Bub	Bubbler
Bub (xxxx)	Bubbler containing xxxx
Char	Charcoal Tube
Char (2)	2 Charcoal tubes in series
Char (pet)	Charcoal Tube (petroleum)
Filter	Particulate filter
Filter (2)	2 Filters in line
Filt/bub	Filter plus bubbler
Imp	Impinger
Imp (xxxx)	Impinger containing xxxx
Resin	Resin-filled adsorption tube
SiO_2	Silica gel adsorption tube
Tenax	Tenax-filled adsorption tube

WORK-UP

These codes are self-explanatory

ANALYSIS

AA	Atomic absorption spectrometry
Color	Colorimetric spectroscopy
Fluorospectro	Fluorescence spectrometry
GC	Gas chromatography
GL	Gas-liquid chromatography
Gravimetric	Self-explanatory
HGA	Flameless atomic absorption in a high-temperature graphite analyzer
HPLC	High-pressure liquid chromatography
IC	Ion exchange chromatography
ICP	Ion exchange chromatography
IR	Infrared spectrometry
ISE	Ion-specific electrode
Titrate	Self-explanatory
XRD	X-ray diffraction spectrometry

Table 1b
NTIS ORDER NUMBERS FOR VALIDATED ANALYTICAL METHODS

Set Code	NTIS No.
A	PB245850
B	PB245851
C	PB245852
D	PB245935
E	PB246148
F	PB246149
G	PB265026
H	PB265027
I	PB265028
J	PB263959
K	PB254227
L	PB250159
M	PB265029
N	PB258433
O	PB262402
P	PB258434
Q	PB258435
R	PB262403
S	PB263871
T	PB262404
U	PB262405
V	PB262542
W	PB262406
Set 1	PB271712
Set 2	PB271464
Set 3	PB275834
Set 4	PB281038
Set 5	PB287499
Set 6	PB288629

NIOSH Manual of Analytical Methods - 2nd edition

78-175	Vol. IV
79-141	Vol. V
80-125	Vol. VI
82-100	Vol. VII

NIOSH Manual of Analytical Methods - 3rd edition

Table 2

PERSONAL PROTECTION AND SANITATION CODES

CLOTHING	Wear appropriate equipment to prevent:
AP liq/RP vap	Any possibility of liquid contact and repeated or prolonged vapor contact with skin
Any poss	Any possibility of skin contact
Any poss wet	Any possibility of skin becoming wet with contaminant
>%AP/y%RP	Any possibility of skin contact with liquids containing more than x% of contaminant, and repeated or prolonged skin contact with liquids containing y%
Prevent skin freezing	Self explanatory
Prevent contam or freeze	Skin contamination or freezing
Prevent wet or freeze	Skin becoming wet or frozen
Repeat prolong	Repeated or prolonged skin contact
Reason prob	Reasonable probability of skin contact
GOGGLES	Wear eye protection to prevent:
Any poss	Any possibility of eye contact
Any poss(xxx)	Any possibility of substance xxx contacting the eyes
Reason prob	Reasonable probability of eye contact
WASH	Employees should wash:
Contam≥ x% immed/y% pro.	Immediately when skin is contaminated with liquids containing ≥ x% contaminant, and promptly when skin is contaminated with y%
Daily	At the end of each work shift
Daily/reason prob	At the end of each work shift when there is reasonable probability of contact with the contaminant
Immed upon contam	Immediately when skin becomes contaminated

Table 2

PERSONAL PROTECTION AND SANITATION CODES (Continued)

Immed upon contam/daily	Immediately when skin becomes contaminated, and at the end of each work shift
Immed upon wet	Immediately when skin becomes wet
Immed wet/pro contam	Immediately when skin becomes wet, and promptly when skin becomes contaminated
Pro contam/ immed wet/daily	Promptly when skin becomes contaminated, immediately when skin becomes wet, and at the end of each work shift
Promptly upon contam	Promptly when skin becomes contaminated
Promptly upon contam/daily	Promptly when skin becomes contaminated and at the end of each work shift
Promptly upon wet	Promptly when skin becomes wet
pH < 3 immed contam/pH $\geqslant$ or 3 pro wet	Immediately when skin becomes contaminated with liquid of pH < 3, and promptly when skin becomes wet with liquid of pH $\geqslant 3$
Soap wash promptly	Promptly wash with soap when skin becomes contaminated
CHANGE	Work clothing should be changed daily
After work if any poss contam	If there is any possibility that the clothing may be contaminated
After work if may be contam	If it is reasonably probable that the clothing is contaminated
REMOVE	Remove clothing:
Any contam immed	Immediately remove any clothing that becomes contaminated
Any wet immed	Immediately remove any clothing that becomes wet
Any wet immed (flamm)	Immediately remove any clothing that becomes wet to avoid flammability hazard

Table 2

PERSONAL PROTECTION AND SANITATION CODES (Continued)

Any wet/contam non-imperv immed	Immediately remove any clothing that becomes wet and any non-impervious clothing that becomes contaminated
Immed any wet/contam non-imperv	Immediately remove any clothing
Immed contam non-imperv	Immediately remove non-impervious clothing that becomes contaminated
Immed wet/ pro contam non-imperv	Immediately remove any non-impervious clothing that becomes wet, and promptly remove any non-impervious clothing that becomes contaminated
Promptly contam non-imperv	Promptly remove non-impervious clothing that becomes contaminated.
Promptly contam/ immed wet non-imperv	Promptly remove non-impervious clothing that becomes contaminated and immediately remove non-impervious clothing that becomes wet
Promptly wet non-imperv	Promptly remove non-impervious clothing that becomes wet
Non-imperv > x% immed/y% pro	Immediately remove non-impervious clothing that becomes contaminated with liquids containing > x% contaminant, and promptly remove clothing contaminated with y%
PROVIDE	The following equipment should be available:
Eyewash	Self-explanatory
Eyewash, quick drench	Self-explanatory
Eyewash (xxx)	Eyewash if substance xxx is present
≥ 5% eyewash	Eyewash if liquids containing ≥ 5% contaminant is present

Table 2

PERSONAL PROTECTION AND SANITATION CODES (Continued)

OTHER CODES

Liq	Liquid
Molt	Molten
N.A.	No recommendation applies in this category
Sol	Solid
Soln	Solutions containing the contaminant
Vap	Vapor

Table 3

RESPIRATOR FOOTNOTES, CODE COMPONENTS, AND CODES

Footnotes

⊛	End of Service Life Indicator required
ϕ	When respirators are to be used
ª	Substance reported to cause eye irritation or damage may require eye protection
ð	If not present as fume
Σ	Only non-oxidizable sorbents are allowed (not charcoal)
Ξ	> at any detectable concentration
ψ	Substance causes eye irritation or damage; eye protection needed
Ω	Emergency or planned entry in unknown concentration or IDLH conditions

Code Components

CCR	Chemical cartridge respirator
D	Dust respirator
Fu	Fume filter
GM	Air purifying respirator (Gas Mask) (front- or back-mounted or chin-style canister)
M	Mist respirator
PAPR	Powered air-purifying respirator
SA	Supplied air-purifying respirator
SCBA	Self-contained breathing apparatus
AG	Acid gas cartridge or canister
CF	Continuous flow
F	Full facepiece
HiE	High-efficiency particulate filter
OV	Organic vapor cartridge or canister
PD,PP	Pressure demand or other positive pressure
S	Chemical cartridge or canister providing protection against the compound of concern
T	Tight-fitting facepiece
XS	Except single-use respirator
XSQ	Except single-use and quarter mask respirator

Table 3

RESPIRATOR FOOTNOTES, CODE COMPONENTS, AND CODES (Continued)

Codes

CCRAGFHiE	Any chemical cartridge respirator with a full facepiece and acid gas cartridge(s) in combination with a high-efficiency particulate filter
CCRAGHiE	Any chemical cartridge respirator with acid gas cartridge(s) in combination with a high-efficiency particulate filter
CCRFOV	Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)
CCRFOVHiE	Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s) in combination with a high-efficiency particulate filter
CCROV	Any chemical cartridge respirator with organic vapor cartridge(s)
CCROVAG	Any chemical cartridge respirator with organic vapor and acid gas cartridge(s)
CCROVAGF	Any chemical cartridge respirator with a full facepiece and organic vapor and acid gas cartridge(s)
CCROVDM	Any chemical cartridge respirator with organic vapor cartridge(s) in combination with a dust and mist filter
CCROVDMF	Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s) in combination with a dust and mist filter
CCROVDMFu	Any chemical cartridge respirator with organic vapor cartridge(s) in combination with a dust, mist, and fume filter
CCROVFD	Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s) in combination with a dust filter

Table 3

RESPIRATOR FOOTNOTES, CODE COMPONENTS, AND CODES (Continued)

Codes

CCROVFDMFu	Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s) in combination with a dust, mist, and fume filter
CCROVHiE	Any chemical cartridge respirator with organic vapor cartridge(s) in combination with a high-efficiency particulate filter
CCRS	Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern
CCRSF	Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern
D	Any dust respirator
DF	Any dust respirator with a full facepiece
DFAG	Any dust respirator with a full facepiece and acid gas cartridge(s) or canister
DM	Any dust and mist respirator
DMF	Any dust and mist respirator with a full facepiece
DMFu	Any dust, mist, and fume respirator with a full facepiece
DMFuF	Any dust, mist, and fume respirator with a full facepiece
DMXS	Any dust and mist respirator except single-use respirators
DMXSQ	Any dust and mist respirator except single-use and quarter-mask respirators
DXSQ	Any dust respirator except single-use and quarter-mask respirators
GMFAG	Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted acid gas canister

Table 3

RESPIRATOR FOOTNOTES, CODE COMPONENTS, AND CODES (Continued)

Codes

GMFHiEAG	Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted acid gas canister having a high-efficiency particulate filter
GMFHiEOV	Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor canister having a high-efficiency particulate filter
GMFHiEOVAG	Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor and acid gas canister having a high-efficiency particulate filter
GMFOV	Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor canister
GMFOVAG	Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor and acid gas canister
GMFOVDM	Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor canister in combination with a dust and mist filter
GMFOVS	Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor canister that also provides protection against the compound of concern
GMFS	Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted canister providing protection against the compound of concern

Table 3

RESPIRATOR FOOTNOTES, CODE COMPONENTS, AND CODES (Continued)

Codes

GMFSHiE	Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted canister providing protection against the compound of concern and having a high-efficiency particulate filter
HiE	Any air-purifying respirator with a high-efficiency particulate filter
HiEF	Any air-purifying full facepiece respirator with a high-efficiency particulate filter
HiEFAG	Any air-purifying full facepiece respirator with a high-efficiency particulate filter and acid gas cartridge(s)
HiEFS	Any air-purifying full facepiece respirator with cartridge(s) providing protection against the compound of concern and having a high-efficiency particulate filter
PAPRAG	Any powered air-purifying respirator with an acid gas cartridge(s)
PAPRDM	Any powered air-purifying respirator with a dust and mist filter
PAPRDMAG	Any powered air-purifying respirator with a dust and mist filter in combination with acid gas cartridge(s)
PAPRDMFu	Any powered air-purifying respirator with a dust, mist, and fume filter
PAPRHiE	Any powered air-purifying respirator with a high-efficiency particulate filter
PAPROV	Any powered air-purifying respirator with organic vapor cartridge(s)
PAPROVAG	Any powered air-purifying respirator with organic vapor and acid gas cartridge(s)

Table 3

RESPIRATOR FOOTNOTES, CODE COMPONENTS, AND CODES (Continued)

Codes

PAPROVDM	Any powered air-purifying respirator with organic vapor cartridge(s) in combination with a dust and mist filter
PAPROVDMFu	Any powered air-purifying respirator with organic vapor cartridge(s) in combination with a dust, mist, and fume filter.
PAPRS	Any powered air-purifying respirator with cartridge(s) providing protection against the compound of concern
PAPRTHiE	Any powered air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
PAPRTOV	Any powered air-purifying respirator with a tight-fitting facepiece and organic vapor cartridge(s)
PAPRTOVHiE	Any powered air-purifying respirator with a tight-fitting facepiece and organic vapor cartridge(s) in combination with a high-efficiency particulate filter
PAPRTS	Any powered air-purifying respirator with a tight-fitting facepiece and cartridge(s) providing protection against the compound of concern
SA	Any supplied-air respirator
SAF	Any supplied-air respirator with a full facepiece
SAF:PD,PP	Any supplied-air respirator with a full facepiece and operated in a pressure-demand or other positive pressure mode
SAF:PD,PP:ASCBA	Any supplied-air respirator with a full facepiece and operated in pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode

Table 3

RESPIRATOR FOOTNOTES, CODE COMPONENTS, AND CODES (Continued)

Codes

SA:CF	Any supplied-air respirator operated in a continuous flow mode
SA:PD,PP	Any supplied-air respirator with a half-mask and operated in a pressure-demand or other positive pressure mode
SAT:CF	Any supplied-air respirator with a tight-fitting facepiece operated in a continuous flow mode
SCBA	Any self-contained breathing apparatus
SCBAE	Any appropriate escape-type self-contained breathing apparatus
SCBAF	Any self-contained breathing apparatus with a full facepiece
SCBAF:PD,PP	Any self-contained breathing apparatus with full facepiece and operated in a pressure-demand or other positive pressure mode

Table 4

ABBREVIATIONS FOR SYMPTOMS OF EXPOSURE

abdom	abdominal
album	albuminuria
anem	anemia
anes	anesthesia
anor	anorexia
anos	anosmia
ANS	autonomic nervous system
apat	apathy
appre	apprehension
arrhy	arrhythmias
asphy	asphyxia
asth	asthma
atax	ataxia
biliru	bilirubinuria
blur	blurred
breath	breathing
bron	bronchitis
bronspas	broncospasm
BUN	blood urea nitrogen
ca	cancer
cachexia	severe generalized weakness, emaciation
carc	carcinogenic/carcinogen
card	cardiac
cere	cerebral
chol	cholinesterase
chor	chorea
cirr	cirrhosis
CNS	central nervous system
coll	collapse
conf	confusion
conj	conjunctivitis
constip	constipation
constric	constriction
convuls	convulsions
cor pulmonale	acute right heart strain or chronic right ventricular hypertrophy
corn	cornea
CVS	cardiovascular system
cyan	cyanosis
defat	defatting

Table 4

ABBREVIATIONS FOR SYMPTOMS OF EXPOSURE (Continued)

deg	degeneration
dent	dental
depres	depressant/depressioin
derm	dermatitis
diarr	diarrhea
dil	dilated
dist	disturbance
dizz	dizziness
drow	drowsiness
dys	dysuria
dysp	dyspnea
dysart	dysarthria
ecz	eczema
emphy	emphysema
enl	enlargement
eosin	eosinophilia
epis	epistaxis
epit	epithelium
equi	equilibrium
ery chol	erythrocyte cholinesterase
eryt	erythema
euph	euphoria
extrem	extremities
fasc	fasiculation
fib	fibrosis
fibrl	fibrillation
frost	frostbite
ftg	fatigue
fvr	fever
gasp	gasping
GI	gastrointestinal
gidd	giddiness
glau	glaucoma
glu	glucose
halu	hallucinations
head	headache
hema	hematuria
hemat	hematoma
hemato	hematopoietic
hemog	hemoglobinuria
hemorr	hemorrhage

Table 4

ABBREVIATIONS FOR SYMPTOMS OF EXPOSURE (Continued)

hep	hepatic
hyper	hyperemia
hypox	hypoxemia
ict	icterus
inco	incoordination
inflamm	inflammation
inj	injury
insom	insomnia
intox	intoxication
irrit	irritation
irrity	irritability
jaun	jaundice
kera	keratitis
kid	kidney
lab	labored
lac	lacrimation
lar	laryngeal
lass	lassitude
leucyt	leukocytosis
leuk	leukemia
leupen	leukopenia
li-head	lightheadedness
liv	liver
lo-ap	appetite loss
low-wgt	weight loss
lymp	lymphocytosis
mal	malaise
malnut	malnutrition
monocy	monocytosis
muc memb	mucous membrane
musc	muscle
myo	myotonia
narc	narcotic
narco	narcosis
nas	nose/nasal
nau	nausea
nec	necrosis
neph	nephritis
ner	nervousness
neur	neurologic

Table 4

ABBREVIATIONS FOR SYMPTOMS OF EXPOSURE (Continued)

numb	numbness
opac	opacity
pal	pallor
palp	palpitations
para	paralysis
pares	paresthesia
paresis	incomplete loss of muscular power; weakness of a limb
parox	paroxysm
perf	perforation
peri neur	peripheral neuropathy
peri neurit	peripheral neuritis
periorb	periorbital
photo	photophobia
pig	pigmentation
plas	plasma
pleur	pleurisy
pneu	pneumonia
pneuitis	pneumonitis
PNS	peripheral nervous system
polyneur	polyneuropathy
pros	prostration
prot	proteinuria
pyspec	psychialopecia
pulm	pulmonary
pulsus altenans.	a pulse pattern in which beats occur at regular intervals, but with alternating weak and strong beats
pup	pupil
RBC	red blood cell
resp	respiratory
resp ar	respiratory arrest
retster	retrosternal
rhin	rhinorrhea
salv	salivation
scotoma	an area of absent or depressed vision in the visual field
sens	sensitization
sez	seizure
sleep	sleepiness

Table 4

ABBREVIATIONS FOR SYMPTOMS OF EXPOSURE (Continued)

sneez	sneezing
som	somnolence
spas	spasm
strabismus	abnormality of the eyes in which the visual axes do not meet at the desired point
subs	substernal
sweat	sweating
swell	swelling
tacar	tachycardia
temp	temperature
tend	tenderness
trachbronc	tracheobronchitis
vasconst	vasoconstriction
venfib	ventricular fibrillation
verti	vertigo
vesic	vesiculation
vis dist	visual disturbance
vomit	vomiting
weak	weakness
wheez	wheezing

Table 5

CODES FOR FIRST AID DATA

EYE	
Irr immed	If this chemical comes in contact with the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.
Irr immed (15 min)	If this chemical comes in contact with the eyes, immediately wash the eyes with large amounts of water and continue flushing for 15 minutes, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.
Irr promptly	If this chemical comes in contact with the eyes, promptly wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention if any discomfort continues. Contact lenses should not be worn when working with this chemical.
Medical attention	Self-explanatory
SKIN	
Dust off solid; water flush	If this solid chemical comes in contact with the skin, dust it off immediately and then flush the contaminated skin with water. If this chemical or liquids containing this chemical penetrate through the clothing, promptly remove the clothing and flush the skin with water. Get medical attention immediately.
Medical attention for frostbite	If this chemical comes in contact with the skin or mouth, stop the exposure immediately. If frostbite has occurred, get medical attention.

Table 5
CODES FOR FIRST AID DATA (Continued)

Molten: flush immed; sol/liq wash	If this molten chemical comes in contact with the skin, immediately flush the skin with large amounts of water. Get medical attention immediately. If this chemical or liquids containing this chemical contacts the skin, promptly wash the contaminated skin with soap and water. If this chemical or liquids containing this chemical penetrate through the clothing, immediately remove the clothing and wash the skin with soap and water. If irritation persists after washing, get medical attention.
Petro product rinse	If this liquid chemical or strong concentrations of this chemical's vapors comes in contact with the skin, immediately rinse the contaminated skin with kerosene or similar petroleum products, if readily available, then wash the skin with soap and water. If this liquid chemical or strong concentrations of this chemical's vapors penetrate through the clothing, immediately remove the clothing and rinse the skin with kerosene or similar petroleum products, if readily available, then wash the skin with soap and water. Get medical attention immediately.
Soap flush immed	If this chemical comes in contact with the skin, immediately flush the contaminated skin with soap and water. If this chemical penetrates through the clothing, immediately remove the clothing and flush the skin with water. If irritation persists after washing, get medical attention.
Soap flush promptly	If this chemical comes in contact with the skin, promptly flush the contaminated skin with soap and water. If this chemical penetrates through the clothing, promptly remove the clothing and flush the skin with water. If irritation

Table 5

CODES FOR FIRST AID DATA (Continued)

	persists after washing, get medical attention.
Soap promptly/ flush immed molten	If this solid chemical or liquids containing this chemical comes in contact with the skin, promptly wash the contaminated skin with soap and water. If irritation persists after washing, get medical attention. If this molten chemical contacts the skin or non-impervious clothing, immediately flush the affected area with large amounts of water to remove heat. Get medical attention immediately.
Soap wash	If this chemical comes in contact with the skin, wash, the contaminated skin with soap and water.
Soap wash immed	If this chemical comes in contact with the skin, immediately wash the contaminated skin with soap and water. If this chemical penetrates through the clothing, immediately remove the clothing, wash the skin with soap and water, get medical attention promptly.
Soap wash promptly	If this chemical comes in contact with the skin, promptly wash the contaminated skin with soap and water. If this chemical penetrates through the clothing, promptly remove the clothing and wash the skin with soap and water. Get medical attention promptly.
Water flush immed	If this chemical comes in contact with the skin, immediately flush the contaminated skin with water. If this chemical penetrates the clothing, immediately remove the clothing and flush the skin with water. Get medical attention promptly.
Water flush promptly	If this chemical comes in contact with the skin, flush the contaminated skin with water promptly. If this chemical penetrates the clothing, immediately remove the clothing

Table 5

CODES FOR FIRST AID DATA (Continued)

	and flush the skin with water promptly. If irritation persists after washing, get medical attention.
Water wash immed	If this chemical comes in contact with the skin, immediately wash the contaminated skin with water. If this chemical penetrates the clothing, immediately remove the clothing and wash the skin with water. If symptoms occur after washing, get medical attention immediately.
Water wash promptly	If this chemical comes in contact with the skin, promptly wash the contaminated skin with water. If this chemical penetrates the clothing, promptly remove the clothing and wash the skin with water. If irritation persists after washing, get medical attention.
BREATH	
Art resp	If a person breathes in large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Get medical attention as soon as possible.
Fresh air	If a person breathes in large amounts of this chemical, move the exposed person to fresh air at once. Other measures are usually unnecessary.
Fresh air; 100%O_2	If a person breathes in large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. When breathing is difficult, properly trained personnel may assist the affected person by administering 100% oxygen. Keep the affected person warm and at rest. Get medical attention as soon as possible.

Table 5

CODES FOR FIRST AID DATA (Continued)

SWALLOW	
Medical attention	If this chemical has been swallowed, get medical attention.
Milk, if N.A., water, NO VOMIT	If this liquid chemical has been swallowed and the person is conscious, immediately give the person large quantities of milk to dilute the chemical. Do not attempt to make the person vomit. Get medical attention immediately. (If milk is not immediately available, give the person water instead of milk.)
NO VOMIT	If this chemical has been swallowed, do not induce vomiting. Get medical attention immediately.
Syrup of Ipecac	If this chemical has been swallowed, immediately get medical attention. If medical attention is not immediately available, get the affected person to vomit by having the person touch the back of the throat with a finger or give the person syrup of ipecac as directed on the package. This non-prescription drug should be kept with emergency medical supplies in the workplace and is available at most drug stores or counters. Do not make an unconscious person vomit.
USE AMYL NITRITE PEARLS (ampules)	If this chemical has been inhaled, comes in contact with the skin, or has been swallowed, immediately administer amyl nitrite as directed on the package.
Water, NO VOMIT	If this chemical has been swallowed and the person is conscious, immediately give the person large quantities of water to dilute the chemical. Do not attempt to make the person vomit. Get medical attention immediately.

Table 5

CODES FOR FIRST AID DATA (Continued)

Water, vomit	If this chemical has been swallowed and the person is conscious, immediately give the person large quantities of water. After the water has been swallowed, try to get the person to vomit by having the person touch the back of their throat with a finger. Do not make an unconscious person vomit. Get medical attention immediately.
Water, vomit; if petroleum base, NO VOMIT......	If this chemical has been swallowed, immediately get medical attention. If the swallowed chemical was dissolved in a petroleum-based material, do not make the exposed person vomit. If medical attention is not immediately available and the swallowed chemical was a powder or was in a water base get the person to vomit by having the person touch the back of their throat with a finger or give the person large amounts (one pint or more) of warm salt water (two tablespoons of salt per pint of water). Do not make an unconscious person vomit.

CHEMICAL LISTING

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Acetaldehyde CH_3CHO 75-07-0 AB1925000 1089 26	Ethanal, Acetic aldehyde	200 ppm (360 mg/m^3) (ACGIH) 100 ppm (180 mg/m^3)	10,000 ppm	Colorless liquid or gas with a penetrating, fruity odor	MW: 44 BP: 69°F Sol: Miscible Fl.P: -36°F IP: 10.21 eV	VP: 750 mm MP: -193°F UEL: 60% LEL: 4%	Strong oxidizers, acids, bases, alcohol, ammonia, amines, phenols, ketones, HCN, hydrogen sulfide	NIOSH 79-141
Acetic acid CH_3COOH 64-19-7 AF1225000 2789 29	Glacial acetic acid, Methane carboxylic acid, Ethanoic acid, Vinegar acid	10 ppm (25 mg/m^3)	1000 ppm	Colorless liquid or solid with a strong vinegar-like odor	MW: 60 BP: 244°F Sol: Miscible Fl.P: 104°F IP: 10.37 eV	VP: 11 mm MP: 62°F UEL: 16% LEL: 5.4%	Strong oxidizers, chromic acid, sodium peroxide, nitric acid, strong caustics	Char; HCOOH; GC; III
Acetic anhydride $(CH_3CO)_2O$ 108-24-7 AK1925000 1715 39	Ethanoic anhydride, Acetic acid anhydride, Acetyl oxide	5 ppm (20 mg/m^3) (ACGIH) 5 ppm ceil (20 mg/m^3)	1000 ppm	Colorless liquid with a characteristic sharp odor	MW: 102 BP: 284°F Sol: 12% Fl.P: 120°F	VP: 4 mm MP: -99°F UEL: 10.3% LEL: 2.9%	Water, alcohols, strong oxidizers, chromic acid, amines, strong caustics	Bub(hydroxylamine); $FeCl_3$; color; L
Acetone CH_3COCH_3 67-64-1 AL3150000 1090 26	2-Propanone, Dimethyl ketone, Ketone propane	1000 ppm (2400 mg/^{3}) (NIOSH) 250 ppm (590 mg/m^3) 10-hr TWA (ACGIH) 750 ppm	20,000 ppm	Colorless liquid with a fragrant, mint-like odor	MW: 58 BP: 133°F Sol: Miscible Fl.P: 1.4°F IP: 9.69 eV	VP(77°F): 266 mm MP: -169°F UEL: 12.8% LEL: 2.6%	Oxidizing materials, acids	Char; CS_2; GC; III

		Health Hazards			
Personal Protection and Sanitation (See Table 2)	**Respirator Selection Upper Limit Devices Recommended (See Table 3)**	**Route**	**Symptoms (See Table 4)**	**First Aid (See Table 5)**	**Target Organs**
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash	AGGIH 1000 ppm: PAPROV•CCRFOV 2500 ppm: SA:CF▾ 5000 ppm: GMFOV/SCBAF/SAF 10,000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing	Eye, nose, throat irrit; conj; cough; CNS depres; eye, skin burns; derm; delayed pulm edem	Eye: Irr immed Skin: Water, flush promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, kidneys
Clothing: ≥ 50% AF/10-49% RP Goggles: Any poss Wash: Contam ≥ 50% imm/ 10-49% pro Change: N.A. Remove: Contam ≥ 50% imm/ 10-49% pro Provide: ≥ 5% eyewash ≥ 50% drench	OSHA 250 ppm: SA:CF▾/PAPROV▾ 500 ppm: CCRFOV/SCBAF/SAF/ GMFOV/PAPRTOV▾ 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh	Conj lac; irrit nose, throat; phar edema, chronic bron: burns eyes, skin; skin sens; dent erosion; black skin, hyperkeratosis	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes, teeth
Clothing: Reason prob Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 125 ppm: SA:CF▾/PAPROV▾ 250 ppm: CCRFOV/SCBAF/SAF/ GMFOV/PAPRTOV▾ 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Conj lac, corn edema, opac, photophobia, nas phar irrit, cough, dysp bron; skin burns, vesic, derm	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 1000 ppm: CCROV/PAPROV/SA/SCBA 6250 ppm: SA:CF▴ 12,500 ppm: GMFOV/SAF/SCBAF 20,000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; head, dizz; derm	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Acetonitrile CH_3CN 75-05-8 AL7700000 1648 28	Methylcyanide	40 ppm (70 mg/m³) (NIOSH) 20 ppm (34 mg/m³) 10-hr TWA	4000 ppm	Colorless liquid with an ether-like odor	MW: 41 BP: 179°F Sol: Miscible Fl.P: 42°F IP: 12.22 eV	VP: 73 mm MP: -50°F UEL: 16% LEL: 4.4%	Strong oxidizers	Char; C_6H_6; GC; III
2-Acetylamino-fluorene $C_{15}H_{13}NO$ 53-96-3 AB9450000 820017	2-Acetamidofluorene, 2-AAF, AAF, 2-Acetaminofluorene, N-Acetyl-2-amino-fluorene, FAA, 2-FAA, 2-Fluoroenylacetamide, N-2-Fluorenylacetamide, N-Fluoren-2-acetylacetamide, N-Fluorenyl-2-acetamide	See Appendix C (NIOSH)	Ca	Tan, cystalline solid	MW: 223 BP: ? Sol: Insoluble Fl.P: N.A.	VP: ? MP: 381°F UEL: N.A. LEL: N.A.	Not available	—
Acetylene tetrabromide $CHBr_2CHBr_2$ 79-27-6 KI8225000 2504 58	Tetrabromoethane; Symmetrical tetrabromoethane; 1,1,2,2-Tetrabromo-ethane	1 ppm (14 mg/m³)	10 ppm	Pale yellow liquid with a pungent odor	MW: 346 BP: 462°F Sol: 0.07% Not combustible	VP: < 0.1 mm MP: 30°F	Chemically active metals, strong caustics, hot iron, aluminum, zinc in presence of steam	SiO_2; THF; GC; L
Acrolein CH_2CHCHO 107-02-8 AS1050000 1092 30	Acrylic aldehyde, Acrylaldehyde, Pro-penal, Allylaldehyde	0.1 ppm (0.25 mg/m³)	5 ppm	Clear colorless or yellowish liquid with a piercing, disagreeable odor, causes tears	MW: 56 BP: 125°F Sol: 22% Fl.P: 15°F IP: 10.10 eV	VP: 214 mm MP: 125°F UEL: 3% LEL: 2.8%	Oxidizers, acids, alkalies, ammonia	Ads; toluene; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Quick drench	OSHA 400 ppm: CCROV/SA/SCBA 1000 ppm: SA:CF/PAPROV/CCRFOV 2000 ppm: GMFOV/SCBAF/SAF 4000 ppm: SA:PD,PP[a] Ω: SCBAF: PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Abs Con	Asphy; nau, vomit; chest pain; weak; stupor, convuls; eye irrit	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Kidneys, liver, CVS, CNS, lungs, skin, eyes
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick crench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Reduced function of liv, kid, bladder, pancreas	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Liver, bladder, kidney, pancreas, skin, lungs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam nonimperv	OSHA 10 ppm: SA/SCBA Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose; anor, nau; severe head; abdom pain; jaun; monocy	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, upper resp sys, liver
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	OSHA 2.5 ppm: SA:CF[a]/PAPROV[a] 5 ppm: CCRFOV/GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, muc memb; abnormal pulm func; delayed pulm edema, chronic resp disease	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Heart, eyes, skin, resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Acrylamide $CH_2CHCONH_2$ 79-06-1 AS3325000 2074 55	Propenamide, Acrylamide monomer, Acylic amide	0.3 mg/m^3 (NIOSH) 0.3 mg/m^3 10-hr TWA	N.A.	Colorless solid	MW: 71 BP: Decomposes Sol: 216% Fl.P: ?	VP: 0.007 mm MP: 183°F UEL: ? LEL: ?	Strong oxidizers	—
Acrylonitrile CH_2CHCN 107-13-1 AT5250000 1093 30	Propenenitrile, An, Vinyl cyanide	2 ppm 10 ppm ceil 15 min (NIOSH) 1 ppm 8-hr TWA 10 ppm 15-min ceil See Appendix A (ACGIH) 2 ppm, A2	4000 ppm Ca	Colorless to pale yellow liquid with a pungent odor	MW: 53 BP: 171°F Sol: 7.1% Fl.P: 30°F IP: 10.91 eV	VP: 83 mm MP: 117°F UEL: 17% LEL: 3%	Strong oxidizers (especially bromine), strong bases, copper, copper alloys, ammonia, amines	Char; ac; GC; K
Aldrin $C_{12}H_8Cl_6$ 309-00-2 IO2100000 2761 55	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-endo, exo-1,4,5,8-dimenthanonaphthalene; Octalene	0.25 mg/m^3 (NIOSH) Lowest detectable limit (0.15 mg/m^3 TWA by NIOSH-validated method) See Appendix A	100 mg/m^3 Ca	Tan to dark brown solid with a mild chemical odor	MW: 365 BP: Decomposes Sol: Insoluble Not combustible Flamm solv	VP: 6×10^{-6} mm MP: 220°F	None hazardous	Filt/bub (osp-octane); iso-octane; GC; III
Allyl alcohol CH_2CHCH_2OH 107-18-6 BA5075000 1098 28	2-Propenol, 2-Propen-1-ol, Vinyl carbinol	2 ppm (5 mg/m^3)	150 ppm	Colorless liquid with an odor like mustard	MW: 58 BP: 206°F Sol: Miscible	VP: 17 mm MP: -200°F LEL: 2.5%	Strong oxidizers	Char; 2-Propanol in SC_2; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon contam Change: After work it may be contam Remove: Immed contam non-imperv Provide: Quick drench	NIOSH 7.5 mg/m^3: SA:CF$^{£}$ 15 mg/m^3: SAF/SCBAF 600 mg/m^3: SAF:PD, PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Atax; numb limbs, pares; musc weak; absent deep tendon reflex; hand sweat; ftg; lethargy; irrit eyes, skin	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, PNS, skin, eyes
Clothing: Repeat prolong Goggles: Any prob Wash: Immed upon wet Change: N.A. Remove: Any wet immed (flamm) Provide: Quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Asphy; irrit eyes; head; sneez; nau, vomit; weak, li-head; skin vesic, scaling derm; [carc]	Eye: Irr immed Skin: Water wash immed Breath: Art resp/amyl nitrite Swallow: Medical attention immed	CVS, liver, kidneys, CNS, skin, brain tumor, lung and bowel cancer
Clothing: Any poss Goggles: Reason prob Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Quick drench	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOVHiE/SCBAE	Inh Abs Ing Con	Head, dizz; nau, vomit, mal; myoclonic jerks of limbs; clonic, tonic convuls; coma; hema, azotemia; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Cancer, CNS, liver, kidneys, skin
Clothing: AP liq/RP vap >25 ppm Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Quick drench	OSHA 50 ppm: SA$^{£}$:CF/PAPROV$^{£}$ 100 ppm: CCRFOV/GMFOV/SCBAF/SAF PAPRTOV$^{£}$ 150 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing	Eye irrit, tissue damage, burns; irrit upper resp, skin; pulm edema	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Allyl chloride CH_2CHCH_2Cl 107-05-1 UC7350000 1100 28	3-Chloropropene, 1-Chloro-2-propene	1 ppm (3 mg/m³) (NIOSH) 1 ppm (3.1 mg/m³) 10-hr TWA 3 ppm (9.3 mg/m³) 15-min ceil	300 ppm	Colorless, yellow, or purple liquid with an unpleasant, pungent odor	MW: 77 BP: 112°F Sol: 0.4% Fl.P: -25°F	VP: 295 mm MP: -209°F UEL: 11% LEL: 3.3%	Strong oxidizers, acids, aluminum, zinc, amines, peroxides, chlorides of iron and aluminum	Char; C_6H_6; GC; III
Allyl glycidyl ether $C_6H_{10}O_2$ 106-92-3 RR0875000 2219 29	AGE; 1-Allyloxy-2,3-epoxy-propane	10 ppm ceil (45 mg/m³) (NIOSH) 10 ppm (45 mg/m³) 15-min ceil (ACGIH) 5 ppm	270 ppm	Colorless liquid with a stong odor	MW: 114 BP: 309°F Sol: 14% Fl.P: 135°F	VP: 2 mm MP: -148°F UEL: ? LEL: ?	Strong oxidizers	Tenax; ethyl ether; GC; Set 2
4-Aminodiphenyl $C_{12}H_{11}N$ 92-67-1 DU8925000	p-Aminobiphenyl; Biphenylamine; (1,1-Biphenyl)-4-amine; p-Phenylaniline; Xenylamine; 4-Aminobiphenyl; p-Aminobiphenyl; p-Biphenylamine; Paraminodiphenyl; 4-Biphenylamine	See Appendix C (NIOSH) (ACGIH) A1b	Ca	Colorless crystals which turn purple on contact with air; floral ordor	MW: 169 BP: 575°F Sol: Slightly Fl.P: 307°F	VP: ? MP: 127°F UEL: ? LEL: ?	None	NIOSH 77-157A
2-Aminopyridine $C_5H_6N_2$ 504-29-0 US1575000 2671 55	alpha-Aminopyridine	0.5 ppm (2 mg/m³)	5 ppm	Colorless solid with a characteristic odor	MW: 94 BP: 410°F Sol: >100% Fl.P: 154°F	VP: Low MP: 133°F UEL: ? LEL: ?	Strong oxidizers	Tenax thermal desorp; GC; Set 4

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Quick drench	NIOSH 25 ppm: SA:CF$^{\pounds}$ 50 ppm: SCBAF/SAF 300 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, skin; pulm edema; lung, liver, kidney damage; deep musc ache; deep bone ache	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes, liver, kidneys
Clothing: Reason prob Goggles: Any poss Wash: Promptly upon contam Change: N.A. Remove: Promptly upon contam non-imperv Provide: Eyewash	NIOSH 96 ppm: SA/SCBA/CCROV 240 ppm: SA:CF$^{\pounds}$/PAPROV$^{\pounds}$ 270 ppm: SCBAF/SAF/PAPRTOV$^{\pounds}$/ GMFOV/CCRFOV Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Derm; eye, nose irrit; pulm irrit, edema; narcos	Eye: Irr immed Skin: Water flush Breath: Art resp Swallow: Medical attention immed	Resp sys, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Head, lethargy, dizz, dysp, ataxia, weak, methemoglobinemia, urinary burning, acute hemorrhage cystitis, [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Bladder, skin
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: After work if may be contam Remove: Immed contam non-imperv Provide: Quick drench	OSHA 5 ppm: SA$^{\pounds}$/SCBA$^{\pounds}$ Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOVHiE/SCBAE	Inh Abs Ing Con	Head, dizz; nau; high BP; resp distress; weak; convuls; stupor	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Ammonia NH_3 7664-41-7 BO0875000 1005 15	Anhydrous ammonia	50 ppm (35 mg/m³) (NIOSH) 50 ppm 5-min ceil (35 mg/m³) (ACGIH) 25 ppm	500 ppm	Colorless gas with a penetrating, pungent, suffocating odor; can be a liquid when under pressure	MW: 17 BP: -28°F Sol: 51% Fl.P: None IP: 10.15 eV	VP: >1 atm MP: -108°F UEL: 25% LEL: 16%	Strong oxidizers, calcium, hypochlorite bleaches, gold, mercury, silver, halogens	SiO + H_2SO_4; ISE; Set 6
Ammonium sulfamate $NH_2SO_3NH_4$ 7773-06-0 WO6125000 9089 31	Ammate herbicide	15 mg/m³ (ACGIH) 10 mg/m³	5000 mg/m³	Colorless, odorless solid	MW: 114 BP: 392°F Sol: 200% Not combustible	VP: ≈0 mm MP: 268°F	Strong oxidizers, hot water	NIOSH 79-141
n-Amyl acetate $CH_3COOC_5H_{11}$ 628-63-7 AJ1925000 1104 26	1-Pentanol acetate, n-Amyl acetate (mixed isomers)	100 ppm (525 mg/m³)	4000 ppm	Colorless liquid with a banana oil odor	MW: 130 BP: 295°F Sol: 0.2% Fl.P: 77°F	VP: 4 mm MP: -95°F UEL: 7.5% LEL: 1.1%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; III
sec-Amyl acetate $C_7H_{14}O_2$ 626-38-0 AJ2100000 1104 26	2-Pentanol acetate	125 ppm (650 mg/m³)	9000 ppm	Clear, colorless liquid with a fruity odor	MW: 130 BP: 273°F Sol: 0.2% Fl.P: 89°F	VP: 7 mm MP: -148°F UEL: ? LEL: 1% (est)	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: > 10% AP/≤ 10% RP Goggles: > 10% AP/≤ RP Wash: > 10% imm con/ ≤ 10% pro wet Change: N.A. Remove: Non-imp con > 10% imm/ ≤ 10% Provide: Eyewash and drench > 10%	NIOSH 300 ppm: CCRS[a] 500 ppm: SA[a]:PAPRS[a] GMFS/SCBA[a] Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	Eye, nose, throat irrit; dysp; bronspas; chest pain; pulm edema; pink frothy sputum; skin burns; vesic	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	ACGIH 50 mg/m^3: DM 100 mg/m^3:DMXSQ/SA 250 mg/m^3: PAPRDM/SA:CF 500 mg/m^3: HiEF/PAPRTHiE/ SAT:CF/SCBAF/SAF 5000 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	None known in humans	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	None known
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV[a]/CCROV[a] SA[a]/SCBA[a] 2500 ppm: SA:CF[a] 4000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Ihn Ing Con	Irrit eyes, nose; narcosis; derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV[a]/CCROV[a] 1250 ppm: SA[a]/SCBA[a] 3125 ppm: SA:CF[a] 6250 ppm: GMFOV/SCBAF/SAF 9000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose; narcosis; derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin

sec-Amyl acetate

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Aniline $C_6H_5NH_2$ 62-53-3 BW6650000 1547 57	Aminobenzene, Phenylamine, Aniline oil	5 ppm (19 mg/m^3) (ACGIH) 2 ppm (10 mg/m^3)	100 ppm	Colorless to brown, oily liquid with a weak amine odor	MW: 93 BP: 364°F Sol: 3.5% Fl.P: 158°F IP: 7.70 eV	VP: 0.6 min MP: 21°F UEL: ? LEL: 1.3%	Stong acids and oxidizers	SiO_2; CH_3CH_2OH; GC; K
Anisidine (o-, p-isomers) $NH_2C_6H_4OCH_3$ 104-94-9 (p-anisidine) BZ5450000 2431 55	o-Methoxyaniline, p-Methoxyaniline	0.5 mg/m^3 (ACGIH) 0.1 ppm (0.5 mg/m^3)	50 mg/m^3	Ortho: colorless to pink liquid with a characteristic amine odor; Para: light red-brown solid with a characteristic amine odor	MW: 123 BP: 436/470°F Sol: 1.3% mod Fl.P: 86°F para	VP: < 0.1 mm MP: 43/137°F UEL: ? LEL: ?	Strong oxidizers	NIOSH 77-157A
Antimony and compounds (as Sb) Sb 7440-36-0 CC4025000 1549 60	Synonyms vary depending upon specific compound	0.5 mg/m^3 (NIOSH) 0.5 mg/m^3 10-hr TWA	80 mg/m^3	Silvery-white solid	MW: 122 BP: 2516°F Sol: Insoluble Fl.P: ?	Vp: 68°F MP: 1202°F UEL: ? LEL: ?	Oxidizers, acids, halogenated acids	Filter; acid; AA; A
ANTU $C_{11}H_{10}N_2S$ 86-88-4 YT9275000 1651 53	alpha-Naphthyl thiourea, alpha-Napthyl thiocarbamide, n-1-Napthyl-thiourea, 1-(1-Naphthly)-2-thiourea	0.3 mg/m^3	100 mg/m^3	Colorless, odorless solid	MW: 202 BP: Decomposes Sol: 0.06% Fl.P: ?	VP: ≅ 0 mm MP: 388°F UEL: ? LEL: ?	Strong oxidizers	NIOSH 79-141

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	ACGIH 20 ppm: CCROV^{4}/ SA^{4}/SCBA^{4} 50 ppm: SA:CF^{4}/PAPROV^{4} 100 ppm: CCRFOV/GMFOV/SCBAF/SAF/ PAPRTOV Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Head; weak, dizz; cyan; atax; dysp on effort; tacar; eye irrit	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Blood, CVS, liver, kidneys
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: After work it may be contam Remove: Immed contam non-imperv Provide: Quick drench	OSHA 2.5 mg/^{3}: DMXS 5 mg/m^{3}: DMXSQ/SA/SCBA 12.5 mg/m^{3}: PAPRDM/SA:CF 25 mg/m^{3}: SAF/SCBAF/HiEF PAPRTHiE^{4} 50 mg/m^{3}: SA:PD,PP^{4} Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Head, dizz; cyan; RBC Heinz bodies	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Blood, kidneys, liver, CVS
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	NIOSH 5 mg/m^{3}: DMXSQ^{4}SA/SCBA 12.5 mg/m^{3}: PAPRDM^{4}/SA:CF 25 mg/m^{3}: HiEF/PAPRTHiE/ SAT:CF/SCBAF/SAF 80 mg/m^{3}: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE/HiEF	Inh Con	Irrit nose, throat, mouth; cough; dizz; head; nau, vomit, diarr; cramps; insom; anor; irrit skin; unable to smell; cardiac	Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CVS, skin, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: After work it may be contam Remove: N.A.	OSHA 3 mg/m^{3}: CCROVDMFu/SA/SCBA 7.5 mg/m^{3}: PAPROVDMFu/SA:CF 15 mg/m^{3}: CCRFOVHiE/PAPRTOVHiE SAT: CF/SCBAF/SAF/GMFOVHiE 100 mg/m^{3}: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing	Vomit; dysp; cyan; coarse pulm, rales after ingestion of large doses	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Arsenic and compounds (as As) As 7740-38-2 CG0525000 1557 53	Synonyms vary depending upon specific compound	10 μg/m³ (NIOSH) 2 μg/m³ 15-min ceil See Appendix A (ACGIH) 200 μg/m³	Ca	Appearance and odor vary	Properties vary depending upon specific compound		Not applicable	NIOSH 77-157A
Arsine AsH_3 7784-42-1 CG6475000 2188 18	Hydrogen arsenide, Arsenic trihydride	0.05 ppm (0.2 mg/m³) (NIOSH) 2 μg/m³ 15-min ceil See Appendix A	6 ppm Ca	Colorless gas with a garlic-like odor	MW: 78 BP: 80.5 °F Sol: 0.07% Not combustible IP: 10.03 eV	VP: >1 atm MP: -177 °F	Strong oxidizers, chlorine, nitric acid	Char; HNO_3; HGA; O
Asbestos 1332-21-4 CI6475000 2212 31 2590 31	Chrysotile, Amosite, Crocidolite, Tremolite, Anthophyllite, Actinolite	See Appendix D (NIOSH) See Appendix D	Ca	Fine, slender, flaxy fibers; resists fire and most solvents	Properties vary depending upon specific compound		None	NIOSH 77-157A
Azinphos-methyl $C_{10}H_{12}N_3O_3PS_2$ 86-50-0 TE1925000 2783 55	Guthion; o,o-Dimethyl S-4-oxo-1,2,3-benzotriazin-3(4H)-yl-methyl phosphorodithioate	0.2 mg/m³	5 mg/m³	Brown, waxy solid	MW: 317 BP: Decomposes Sol: 0.003% Fl.P: ?	VP: ≈0 mm MP: 163 °F UEL: ? LEL: ?	Strong oxidizers	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEAG/SCBAE	Inh Abs Con Ing	Ulceration of nas septum, derm, GI disturbances, peri neur, resp irrit, hyperpig of skin, [carc]	Eye: Irr immed (15 min) Skin: Soap wash immed Swallow: Medical attention immed	Liver, kidneys, skin, lungs, lymphatic system
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh	Head; malaise, weak, dizz; dypsnea; abdom and back pain; nau, vomit; bronze skin; hema; jaun; peri neur; [carc]	Breath: Art resp	Blood, kidneys, liver
Clothing: Any poss Goggles: Reason prob Wash: Daily Change: After work it may be contam	NIOSH Ξ: SAF:PD,PP:ASCBA/SCBAF:PD,PP Escape: HiEF/SCBAE	Inh Ing	Dysp, interstitial fib, restricted pulm function, finger clubbing, [carc]	Eye: Irr immed	Lung
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Quick drench	OSHA 2 mg/m³: SA/SCBA/CCROVDMFu 5 mg/m³: PAPROVDMFu/ SA:CF/CCRFOVHiE/PAPRTOVHiE/ SAT:CF/SCBAF/SAF/GMFOVHiE Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Miosis; ache eyes; rhin; head; chest wheez, lar spas; salv; cyan; anor; nau, vomit, diarr; sweat; twitch, para, convul; low BP; card	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CNS, CVS, blood cholinesterase

Azinphos-methyl

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Barium (soluble compounds as Ba) Ba 7440-39-3 CQ8370000 1564 55	Synonyms vary depending upon specific compound	0.5 mg/m^3	250 mg/m^3	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Incompatibilities vary depending upon specific compound	Filter (cellulose membrane); hot H_2O; AA; N
Benzene C_6H_6 71-43-2 CY1400000 1114 27	Benzol, Cyclohexatriene, Coal tar naphtha, Phenyl hydride	10 ppm 50 ppm ceil (10 min) (NIOSH) 1 ppm 60-min ceil See Appendix A (ACGIH) 10 ppm, A2	2000 ppm Ca	Colorless liquid with an aromatic odor	MW: 78 BP: 176°F Sol: 0.18% Fl.P: 12°F IP: 9.25 eV	VP: 75 mm MP: 42°F UEL: 7.1% LEL: 1.3%	Strong oxidizers; chlorine, bromine with iron	Char; CS_2; GC; III
Benzidine $C_{12}H_{12}N_2$ 92-87-5 DC9625000 810001 1885 53	1,1-Biphenyl-4, 4-diamine; 4,4-Diaminobiphenyl; 4,4-Biphenyldiamine; 4,4-Bianiline; 4,4-Diphenylenediamine; 4,4-Diaminodiphenyl; Azoic Diazo Component 112; Fast Corinth Base B; Biphenyl, 4,4′-diamino- p-Diaminodiphenyl	See Appendix C (NIOSH) (ACGIH) A1b	Ca	Colorless or slightly reddish crystalline compound that darkens on exposure to light and air	MW: 184 BP: 755°F Sol: 400 mg/l at 12°C Fl.P: Combustible solid	VP: ? MP: 243°F UEL: ? LEL: ?	Not available	NIOSH 77-157A
Benzoyl peroxide $(C_6H_5CO)_2O_2$ 94-36-0 DM8575000 2085 2086 2087 2088 2089 2090 49	Dibenzoyl peroxide	5 mg/m^3 (NIOSH) 5 mg/m^3 10-hr TWA	1000 mg/m^3	Colorless, odorless solid	MW: 242 BP: N.A. Sol: < 1 Fl.P: ?	VP: <<1 mm MP: 217°F UEL: ? LEL: ?	Combustible substances, wood, paper, lithium aluminum hydride; explosive at high temperatures	Filter ethyl ether, HPLC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Recommendations vary depending upon specific compound	OSHA 5 mg/m³: DMXSQ/SA/SCBA 12.5 mg/m³: PAPRDM/SA:CF 25 mg/m³: HIEF/PAPRTHiE/SAT:CF/SCBAF/SAF 250 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Upper resp irrit; GI; musc spas; slow pulse, extrasystoles; hypokalemia; irrit eyes; skin burns	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Heart, CNS, skin, resp sys, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Soap wash promptly Change: N.A. Remove: Any wet immed (flamm)	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, resp sys; giddy; head; nau; staggered gait; ftg, anor, lass; derm; bone marrow depres; abdom pain; [carc]	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Blood, CNS, skin, bone marrow, eyes, resp sys
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Ing Abs Ing Con	Hema, secondary anem from hemolysis, acute cystitis, acute liv disorders, derm, painful and irregular urination, [carc]	Eye: Irr immed (15 min) Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Bladder, kidney, liver, skin, blood
Clothing: Repeat prolong Goggles: Reason poss Wash: Promptly upon contam Change: After work if may be contam Remove: Promptly contam non-imperv	NIOSH 50 mg/m³: DMXSQ^{a}/SA^{a}/SCBA^{a} 125 mg/m³: PAPRDM^{a}/SA:CF^{a} 250 mg/m³: HiEF/SCBAF/SAF/PAPRTHiE^{a} 1000 mg/m³: SA:PD,PP^{a} Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit skin, eyes, muc memb; derm	Eye: Irr immed Skin: Soap wash promptly Swallow: Medical attention immed	Skin, resp sys, eyes

Benzoyl peroxide

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Benzyl chloride $C_6H_5CH_2Cl$ 100-44-7 XS8925000 1738 59	alpha-Chlorotoluene, Benzylchloride anhydrous, Benzylchloride (stabilized)	1 ppm (5 mg/m³) (NIOSH) 5 mg/m³ 15-min ceil	10 ppm	Colorless to slightly yellow liquid with a pungent, aromatic, irritating odor	MW: 127 BP: 354°F Sol: 0.0033% Fl.P: 140°F	VP: 0.9 mm MP: -39°F UEL: ? LEL: 1.1%	Active metals: copper, aluminum, magnesium, iron, zinc, tin; strong oxidizers	Char; CS_2; GC; III
Beryllium and compounds (as Be) Be 7440-41-7 DS1750000 1566 53	Synonyms vary depending upon specific compound	2.0 µg/m³ 5.0 µg/m³ ceil 25 µg/m³ (30-min ceil) (NIOSH) Not to exceed 0.5 µg/m³ See Appendix A (ACGIH) 2 µg/m³, A2	Ca	Appearance and odor vary	Properties vary depending upon specific compound		None	NIOSH 77-157A
Boron oxide B_2O_3 1303-86-2 ED7900000	Anhydrous boric acid, Boric anhydride, Boric oxide	15 mg/m³ (ACGIH) 10 mg/m³	N.A.	Colorless, glassy granules or flakes with no odor	MW: 70 BP: 4622°F Sol: 2.8% Not combustible	VP: ≅0 mm MP: 842°F	None hazardous	Filter; —; gravimetric; III
Boron trifluoride BF_3 7637-07-2 ED2275000 1008 15	None	1 ppm ceil (3 mg/m³)	100 ppm	Colorless gas which fumes in moist air with pungent irritating odor	MW: 68 BP: -149°F Sol: Very soluble Not combustible IP: 15.55 eV	VP: >1 mm MP: -197°F	Reacts with alkalies, fumes in moist air, particulates reduce visibility	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH 10 ppm: SA[*]/PAPROVAG/[*] CCROVAG[*]/GMFOVAG/SCBA[*] Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOVAG/SCBAE	Inh Ing Con	Irrit eyes, nose; weak; irritable; head; skin eruption; pulm edema	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin
Clothing: Repeat prolong Goggles: Recommended Wash: Daily Change: After work if any poss contam Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/SAF:PD, PP:ASCBA Escape: HiEF/SCBAE	Inh	Resp symptoms, weak, ftg, weight loss, [carc]	Eye: Irr immed	Lung, skin, eyes, mucous membranes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 50 mg/m^3: DM[*] 100 mg/m^3: DMXSQ[**]/SA[*]/SCBA[*] 250 mg/m^3: PAPRDM[**]/SA:CF[*] 500 mg/m^3: SCBAF/SAF/ HiEF/PAPRTHiE[*] 7500 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Nasal irrit, conj, erythema, low toxicity	Eye: Irr immed Skin: Water flush promptly Breath: Fresh air Swallow: Medical attention immed	Skin, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 10 ppm: SA[*]/SCBA[*] 25 ppm: SA:CF[*] 50 ppm: SCBAF/SAF 100 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Con	Nasal irrit, epis; burns eyes, skin; in animals: pneu, kidney damage, nosebleed	Eye: Irr immed Skin: Water flush immed Breath: Art resp	Resp sys, kidneys, eyes, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Bromine Br_2 7726-95-6 EF9100000 1744 59	None	0.1 ppm (0.7 mg/m^3)	10 ppm	Heavy, red-brown, fuming liquid with a choking, irritating odor; causes tears	MW: 160 BP: 138°F Sol: 3.5% Not combustible, but strong oxidizer IP: 10.52 eV	VP: 175 mm MP: 19°F	Combustible organics, oxidizable material, aqueous ammonia; anhydrous Br_2 reacts with aluminum, titanium, mercury, potassium; wet Br_2 reacts with other metals	—
Bromoform $CHBr_3$ 75-25-2 PB5600000 2515 58	Tribromomethane	0.5 ppm (5 mg/m^3)	N.A.	Colorless to yellow liquid with an odor like chloroform	MW: 253 BP: 298°F Sol: 0.1% Not combustible IP: 10.51 eV	VP: 5 mm MP: 46°F	Chemically active metals: sodium, potassium, calcium, powered aluminum, zinc, magnesium, strong caustics	Char; CS_2; GC; III
Butadiene $CH_2CHCHCH_2$ 106-99-0 EI9275000 1010 17	1,3-Butadiene; Divinyl; Biethylene; Erythrene	1000 ppm (2200 mg/m^3) (NIOSH) Reduce exposures to lowest feasible limit See Appendix A (ACGIH) 10 ppm, A2	20,000 ppm Ca	Colorless gas with a mildly aromatic odor. Liquid <24°F	MW: 54 BP: 24°F Sol: 0.05% Fl.P: N.A. IP: 9.07 eV	VP: 910 mm MP: -164°F UEL: 11.5% LEL: 2%	Strong oxidizers, copper, copper alloys	Char; CS_2; GC; G
2-Butanone $CH_3COCH_2CH_3$ 78-93-3 EL6475000 1193 26	Methyl ethyl ketone, MEK, Ethyl methyl ketone	200 ppm (590 mg/m^3) (NIOSH) 590 mg/m^3 10-hr TWA (200 ppm)	3000 ppm	Clear, colorless liquid with a fragrant, mint-like, moderately sharp odor	MW: 72 BP: 175°F Sol: 27% Fl.P: 21°F IP: 9.48 eV	VP: 70 mm MP: -123°F UEL: 10% LEL: 2%	Very strong oxidizers	Ads; CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any immed contam Provide: Eyewash, quick drench	OSHA 2.5 ppm: SA:CF$^{\bullet}$/PAPRS$^{\ddagger\bullet}$ 5 ppm: CCRSF‡/GMFS‡/SCBAF/ PAPRTS$^{\ddagger\bullet}$/SAF 10 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	Dizz, head, lac, epis, cough, feeling of oppression, pulm edema, pneu, abdom pain, diarr, measle-like eruptions, severe burns eyes, skin	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	OSHA 12.5 ppm: SA:CF$^{\bullet}$/PAPROV$^{\bullet}$ 25 ppm: CCRFOV/GMFOV/SCBAF/SAF PAPRTOV$^{\bullet}$ 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Ing Inh Abs	Irrit eyes, resp sys; CNS depression; liver damage	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, liver, kidneys, resp sys, CNS
Clothing: Prevent skin freezing Goggles: Reason prob Wash: Immed upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Con	Irrit eyes, nose, throat; drow, li-head; frosbite; [carc]	Eye: Irr immed Skin: Water flush immed Breath: Medical attention immed	Eyes, resp sys, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Promptly contam non-imperv Provide: Eyewash	NIOSH 1000 ppm: PAPROV$^{\bullet}$/CCRFOV 3000 ppm: GMFOV/SA:CF$^{\bullet}$/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose; head; dizz; vomit	Eye: Irr immed Skin: Water wash immed Breath: Fresh air Swallow: Medical attention immed	CNS, lungs

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
2-Butoxy ethanol $C_4H_9OCH_2CH_2OH$ 111-76-2 KJ8575000 2369 26	Butyl cellosolve, ethyleneglycol monobutylether, Dowanol EB, Butyl oxitol, Jeffersol EB, Ektasolve EB	50 ppm (240 mg/m^3) (ACGIH) 25 ppm (120 mg/m^3)	700 ppm	Colorless liquid with a mild odor	MW: 118 BP: 340°F Sol: Miscible <118°F Fl.P: 141°F	VP: 0.6 mm MP: -94°F UEL: 10.6% LEL: 1.1%	Strong oxidizers and caustics	Char; CH_3OH/ CH_2Cl_2; GC; III
Butyl acetate $CH_3COO(CH_2)_3CH_3$ 123-86-4 AF7350000 1123 26	n-Butyl acetate, Butyl ethanoate, Acetic acid butyl ester	150 ppm (710 mg/m^3)	10,000 ppm	Colorless liquid with a fruity odor	MW: 116 BP: 260°F Sol: 0.68% Fl.P: 72% IP: 9.56 eV	VP: 10 mm MP: -101°F UEL: 7.6% LEL: 1.7%	Nitrates; strong ozidizers, alkalies, and acids	Char; CS_2; GC; III
sec-Butyl acetate CH_3COOCH $(CH_3)C_2H_5$ 105-46-4 AF7380000 1123 26	1-Methylpropylacetate	200 ppm (950 mg/m^3)	10,000 ppm	Colorless liquid with a pleasant odor	MW: 116 BP: 234°F Sol: 0.8% Fl.P: 62°F IP: 9.91 eV	VP: 10 mm MP: -146°F UEL: 9.8% LEL: 1.7%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; III
tert-Butyl acetate $CH_3COOC(CH_3)_3$ 540-88-5 AF7400000 1123 26	Acetic acid tert-butyl ester	200 ppm (950 mg/m^3)	8000 ppm	Colorless liquid with a fruity odor	MW: 116 BP: 208°F Sol: ? Fl.P: 62 to 72°F(est)	VP: ? MP: ? UEL: ? LEL: 1.5% (est)	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	ACGIH 250 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 625 ppm: PAPROV$^{\blacktriangle}$/SA:CF$^{\blacktriangle}$ 700 ppm: GMFOV/CCRFOV/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Abs Con	Irrit eyes, nose, throat; hemolysis, hemoglobinuria	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Liver, kidneys, lymphoid sys, skin, blood, eyes, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV$^{\blacktriangle}$/CCROV$^{\blacktriangle}$ 1500 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 3750 ppm: SA:CF$^{\blacktriangle}$ 7500 ppm: GMFOV/SCBAF/SAF 10,000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Head; drow; eyes irrit, dry; irrit resp sys	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV$^{\blacktriangledown}$/CCRFOV 5000 ppm: SA:CF$^{\blacktriangledown}$ 10,000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, head, drow, dry upper resp, dry skin	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV$^{\blacktriangledown}$/CCRFOV 5000 ppm: SA:CF$^{\blacktriangledown}$ 8000 ppm:GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Itch, inflamm eyes; irrit upper resp; head; narco; derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Butyl alcohol $CH_3CH_2CH_2CH_2OH$ 71-36-3 EO1400000 1120 26	1-Butanol, Propylcarbinol, n-Butanol, n-Butyl alcohol, NBA	100 ppm (300 mg/m³) (ACGIH) 50 ppm ceil (150 mg/m³)	8000 ppm	Colorless liquid with a strong, characteristic odor	MW: 74 BP: 244 °F Sol: 7.7% Fl.P: 84 °F IP: 10.04 eV	VP: 4.2 mm MP: -128 °F UEL: 11.2% LEL: 1.4%	Strong oxidizers	Char; 2-Propanol in CS_2; GC; III
sec-Butyl alcohol $CH_3CHOHCH_2CH_3$ 78-92-2 EO1750000 1120 26	2-Butanol, Methyl ethyl carbinol, Butylene hydrate, 2-Hydroxybutane	150 ppm (450 mg/m³) (ACGIH) 100 ppm (305 mg/m³)	10,000 ppm	Colorless liquid with a strong, pleasant odor	MW: 74 BP: 211 °F Sol: 15% Fl.P: 75° IP: 10 eV	VP: 13 mm MP: -175 °F UEL: 9.8 LEL: 1.7	Strong oxidizers	Char; 2-Propanol in CS_2; GC; III
tert-Butyl alcohol $(CH_3)_3COH$ 75-65-0 EO1925000 1120 68	2-Methyl-2-propanol, TBA, Trimethylcarbinol	100 ppm (300 mg/m³)	8000 ppm	Colorless liquid with a camphor-like odor	MW: 74 BP: 181 °F Sol: Miscible Fl.P: 52 °F IP: 9.97 eV	VP: 31 mm MP: 77 °F UEL: 8% LEL: 2.4%	Strong mineral acids, strong hydrochloric acid	Char; 2-Butanol in CS_2; GC; III
Butylamine $C_4H_9NH_2$ 109-73-9 EO2975000 1125 29	n-Butylamine, 1-Aminobutane	5 ppm ceil (15 mg/m³)	2000 ppm	Colorless liquid with an odor like ammonia or fish	MW: 73 BP: 172 °F Sol: Miscible Fl.P: 10 °F IP: 8.71 eV	VP: 82 mm MP: -56 °F UEL: 9.8% LEL: 1.7%	Strong oxidizers and acids	NIOSH 77-157A

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	ACGIH 1000 ppm: PAPROV*/CCRFOV 1250 ppm: SA:CF* 2500 ppm: GMFOV/SCBAF/SAF 8000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; head; vert; drow; corneal inflamm, blur vision, lac, photophobia; dry cracked skin	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	ACGIH 1000 ppm: PAPROV*/CCRFOV SA*/SCBA* 2500 ppm: SA:CF* 5000 ppm: GMFOV/SCBAF/SAF 10,000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Eye irrit, narcosis, dry skin	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm :PAPROV*/CCRFOV 2500 ppm: SA:CF* 5000 ppm: GMFOV/SCBAF/SAF 8000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Drow; irrit skin, eyes; head; dizz; dry skin	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	OSHA 50 ppm: SA*/SCBA*/CCRS* 125 ppm: SA:CF*/PAPRS* 250 ppm: CCRSF/GMFS/SCBAF/SAF/ PAPRTS* 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat; head; skin flush, burns	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
tert-Butyl chromate (as CrO_3) $((CH_3)_3CO)_2CrO_2$ 1189-85-1 GB2900000	Chromic acid, di-tert-Butyl ester; bis (tert-Butyl) chromate	0.1 mg/m^3 ceil	N.A.	Liquid	MW: 230 BP: ? Sol: ? Fl.P: ?	VP: ? MP: 23 to 32°F UEL: ? LEL: ?	Reducing agents, moisture	—
n-Butyl glycidyl ether $C_4H_9OCH_2CHOCH_2$ 2426-08-6 TX4200000	BGE; 1,2-Epoxy-3-butoxypropane	50 ppm (270 mg/m^3) (NIOSH) 5 ppm (30 mg/m^3) 15-min ceil (ACGIH) 25 ppm	3500 ppm	Pale yellow liquid	MW: 130 BP: 327°F Sol: 2% Fl.P: 130°F	VP: 3 mm MP: ? UEL: ? LEL: ?	Strong oxidizers and caustics	Char; CS_2; GC; F
Butyl mercaptan $CH_3CH_2CH_2CH_2SH$ 109-79-5 EK6300000 2347 27	n-Butanethiol, 1-Mercaptobutane, 1-Butanethiol	10 ppm (35 mg/m^3) (NIOSH) 0.5 ppm (1.5 mg/m^3) 15-min ceil	2500 ppm	Colorless liquid with a strong, skunk-like odor	MW: 90 BP: 208°F Sol: 0.6% Fl.P: 35 °F IP: 9.14 eV	VP: 35 mm MP: -176°F UEL: ? LEL: ?	Strong oxidizers, such as dry bleaches	Ads; acetone; GC; Set 3
p-tert-Butyltoluene $CH_3C_6H_4C_4H_9$ 98-51-1 XS8400000 2667 27	1-Methyl-4-tert-butylbenzene	10 ppm (60 mg/m^3)	1000 ppm	Colorless liquid with an aromatic odor, somewhat like gasoline	MW: 148 BP: 380°F Sol: Insoluble Fl.P(oc): 155°F	VP: <1 mm MP: -62°F UEL: ? LEL: ?	Oxidizers	Char; CS_2 GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 2.5 mg/m^3: SA:CF$^{\blacktriangledown}$ 5 mg/m^3: SCBAF/SAF 200 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Lungs, sinus	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes, CNS
Clothing: Any poss Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly upon contam non-imperv	NIOSH 56 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$/CCROV$^{\blacktriangle}$ 140 ppm: SA:CF$^{\blacktriangle}$/PAPROV$^{\blacktriangle}$ 280 ppm: SCBAF/SAF/CCRFOV/GMFOV/ PAPRTOV$^{\blacktriangle}$ 3500 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose; skin irrit, sens; narcosis	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 5 ppm: SA/SCBA/CCROV 12.5 ppm: SA:CF/PAPROV 25 ppm: SCBAF/SAF/CCRFOV/PAPRTOV/ GMFOV 500 ppm: SA:PD:PP$^{\blacktriangle}$ 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	In animals: narcosis, inco, weak, cyan, pulm, eye irrit, paralysis	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys; in animals: CNS, liver, kidneys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	OSHA 250 ppm: SA:CF$^{\blacktriangledown}$/PAPROV$^{\blacktriangledown}$ 500 ppm: CCRFOV/GMFOV/SCBAF/SAF 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin; dry nose, throat; head; low BP, tacar, abnormal CVS; CNS depres; hemato depres	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	CVS, CNS, skin, bone marrow, eyes, upper resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Cadmium dust (as Cd) Cd 7440-43-9 EU9800000 2570 53	Synonyms vary depending upon specific compounds	0.2 mg/m³ 0.6 mg/m³ ceil (NIOSH) Reduce exposure to lowest feasible limit See Appendix A (ACGIH) 0.05 mg/m³	40 mg/m³ Ca	Appearance and odor vary for specific compound	Properties vary depending upon specific compound		Strong oxidizers, elemental sulfur, selenium, tellurium	Filter; acid; AA; III
Cadmium fume (as Cd) Cd/CdO 1306-19-0 EV1930000 2570 53	Cadmium oxide fume	0.1 mg/m³ 0.3 mg/m³ ceil (NIOSH) Reduce exposure to lowest feasible limit See Appendix A (ACGIH) 0.05 mg/m³ ceil	40 mg/m³ Ca	Finely divided solid particles dispersed in air	MW: 112 to 128 BP: N.A. Sol: Insoluble Fl.P: N.A.	VP: ≈0 mm MP: N.A. UEL: N.A. LEL: N.A.	Not applicable	Filter; acid; AA; III
Calcium arsenate (as As) $Ca_3(AsO_4)_2$ 7778-44-1 CG0830000 1573 53	Tricalcium arsenate; Tricalcium orthoarsenate; Cucumber dust; arsenic acid, calcium salt (2:3)	10 μg/m³ (NIOSH) 2 μg/m³ 15-min ceil See Appendix A	100 mg/m³ Ca	Colorless, odorless solid	MW: 398 BP: N.A. Sol: 0.013% Not combustible	VP: 0 mm MP: N.A.	None hazardous	NIOSH 77-157A
Calcium oxide CaO 1305-78-8 EW3100000 1910 60	Quicklime, Pebble lime	5 mg/m³ (ACGIH) 2 mg/m³	250 mg/m³	White or gray, odorless solid	MW: 56 BP: 5162°F Sol: Reacts Not combustible	VP: 0 mm MP: 4658°F	Water	Filter; acid; AA; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: N.A. Goggles: Any poss ($CdCl_2$) Wash: Daily/reason prob Change: After work any poss contam Remove: N.A. Provide: Eyewash ($CdCl_2$)	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing	Pulm edema, dysp, cough, tight chest, subs pain; head; chills, muscle aches; nau, diarr; anos, emphy; prot; anemia; [carc]	Eye: Irr immed Skin: Soap wash Breath: Art resp Swallow: Medical attention immed	Resp sys, kidneys, prostate, blood
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh	Pulm edema, dysp, cough, tight chest, subs pain; head; chills, muscle aches; nau, diarr; emphy; prot; anos; mild anem; [carc]	Breath: Art resp	Resp sys, kidneys, blood
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon contam/daily Change: After work any poss contam Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Weak; GI; peri neur; hyperpigment, palmar planter hyperkeratoses; derm; [carc]	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, liver, skin, lymphatics, CNS
Clothing: Reason prob Goggles: Any poss Wash: Promptly upon contam/daily Change: After work it may be contam Remove: Promptly contam non-imperv Provide: Eyewash, quick drench	ACGIH 10 mg/m^3: DM 20 mg/m^3: DMXSQ/SA/SCBA 50 mg/m^3: PAPRHiE/SA:CF 100 mg/m^3: HiEF/SCBAF/SAF/PAPRTHiE 250 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit eyes, upper resp tract; ulcer, perforate nasal septum; pneumonia; derm, burns	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes

Calcium oxide

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Camphor $C_{10}H_{16}O$ 76-22-2 EX1225000 2717 32	2-Camphonone, Synthetic camphor, Gum camphor, Laurel camphor	2 ppm (12 mg/m³)	200 mg/m³	Colorless, glassy solid with a penetrating, characterisitc odor	MW: 152 BP: 405°F Sol: 0.12% Fl.P: 150 °F	VP: 0.18 mm MP: 356°F UEL: 3.5% LEL: 0.6%	Oxidizers, chromic anhydride	Char; CH_3OH/CS_2; GC; III
Carbaryl (Sevin®) $C_{12}H_{11}NO_2$ 63-25-2 FC5950000 2757 55	1-Naphthyl n-methyl-carbamate, alpha-Naphthyl n-methyl-carbamate	5 mg/m³ (NIOSH) 5 mg/m³ 10-hr TWA	625 mg/m³	Colorless solid	MW: 201 BP: Decomposes Sol: 0.004% Fl.P: ?	VP: 0.005 mm MP: 268° F UEL: ? LEL: ?	Stong oxidizers	Filter; acid; color; III
Carbon black 1333-86-4 FF5800000	Channel black, Lamp black, Furnace black, Thermal black, Acetylene black	3.5 mg/m³ (NIOSH) 3.5 mg/m³ 10-hr TWA 0.1 mg/m³ TWA in presence of polycyclic aromatic hydrocarbons See Appendix A	Ca	Black odorless solid	MW: 12 BP: N.A. Sol: Insoluble Fl.P: N.A.	VP: ≅0 mm MP: N.A. UEL: ? LEL: ?	Strong oxidizers, such as chlorates, bromates, nitrates	Filter; —; gravimetric; III
Carbon dioxide CO_2 124-38-9 FF6400000 1013 21	Carbonic acid gas, Dry ice	5000 ppm (NIOSH) 10,000 ppm 10-hr TWA 30,000 ppm 10-min ceil	50,000 ppm	Colorless, odorless gas; can be liquid or solid	MW: 44 BP: -109°F (sublimes) Sol: 0.14% Not Combustible IP: 13.77 eV	VP: >1 atm MP: -109°F (sublimes)	Chemically active metals, such as sodium, potassium, hot titanium	Bag; —; GC; Set 1

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 50 mg/m^3: SA:CF$^{\blacktriangledown}$/PAPROVDM$^{\blacktriangledown}$ 100 mg/m^3: CCROVHiEF/GMFOVHiE/ PAPRTOVHiE$^{\blacktriangledown}$/SCBAF/SAF 200 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing Con	Irrit eyes, skin, muc memb; nau, vomit, diarr; head; dizz; irrational, epileptiform convuls	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, eye, skin, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	NIOSH 50 mg/m^3: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 125 mg/m^3: SA:CF$^{\blacktriangle}$ 250 mg/m^3: SCBAF/SAF 625 mg/m^3: SA:PD,PP$^{\blacktriangle}$ Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Miosis, blur, tear; nasal discharge; salv; sweat; abdom cramps, nau, vomit, diarr; tremor; cyan; convuls; skin irrit	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, CNS, CVS, skin
Clothing: N.A. Goggles: Repeat Wash: Daily Change: N.A. Remove: N.A.	See Appendix B	Inh Con	None expected; in presence of polycyclic aromatic hydrocarbons: [carc]	Eye: Irr promptly	None known
Clothing: Prevent skin freezing Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 50,000 ppm: SA/SCBA Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Con	Head, dizz, restless, pares; dysp; sweat; mal; inc heart rate, elevate BP, pulse pressure; coma; asphy; convuls; frostbite	Eye: Medical attention Skin: Medical attention for frostbite Breath: Art resp	Lungs, skin, CVS

Carbon dioxide

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Carbon disulfide CS_2 75-15-0 FF6650000 1131 28	Carbon bisulfide	20 ppm 30 ppm ceil 100 ppm 30-min ceil (NIOSH) 1 ppm 10-hr TWA 10 ppm 15-min ceil (ACGIH) 10 ppm	500 ppm	Colorless to faintly yellow liquid with a strong, disagreeable or sweetish odor	MW: 76 BP: 115°F Sol: 0.2% Fl.P: -22°F IP: 10.06 eV	VP: 300 mm MP: -169°F UEL: 50% LEL: 1.3%	Strong oxidizers; chemically active metals, such as sodium, potassium, zinc; azides, organic amines	Char; C_6H_6; GC; III
Carbon monoxide CO 630-08-0 FG3500000 1016 18	Monoxide	50 ppm (55 mg/m³) (NIOSH) 35 ppm 8-hr TWA 200 ppm ceil (No minimum time)	1500 ppm	Colorless, odorless gas	MW: 28 BP: -313°F Sol: 0.004% Fl.P: N.A. IP: 13.98 eV	VP: >1 atm MP: -326 °F UEL: 74% LEL: 12.5%	Strong oxidizers	NIOSH 77-157A
Carbon tetrachloride CCl_4 56-23-5 FG4900000 1846 55	Tetrachloromethane	10 ppm 25 ppm ceil 200 ppm 5-min/4-hr peak (NIOSH) 2 ppm 60-min ceil See Appendix A (ACGIH) 5 ppm, A2	300 ppm Ca	Colorless liquid with an ether-like odor	MW: 154 BP: 170 °F Sol: 0.08% Not comustible	VP: 91 mm MP: -9°F	Chemically active metals, such as sodium, potassium, magnesium	Char; CS_2; GC; III
Chlordane $C_{10}H_6Cl_8$ (approx) 57-74-9 PB9800000 2762 28	1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetra-hydro-4,7-methanoindane	0.5 mg/m³	500 mg/m³	Thick, amber liquid with a chlorine-like odor	MW: 410 BP: Decomposes Sol: Insoluble Not combustible	VP: 0.00001 mm MP: ?	Strong oxidizers	NIOSH 80-125

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	NIOSH 10 ppm: CCROV/SA/SCBA 25 ppm: SA:CF/PAPROV 50 ppm: CCRFOV/PAPRTOV/GMFOV/ SCBAF/SAF 500 ppm: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Dizz, head, poor sleep, ftg, ner; anor, low-wgt; psychosis; polyneur; Parkinson-like; ocular changes; CVS; GI; burns, derm	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, PNS, CVS, eyes, kidneys, liver, skin
Clothing: Prevent skin freezing Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	NIOSH 350 ppm: SA/SCBA 875 ppm: SA:CF 1500 ppm: SCBAF/SAF/GMFS* Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS*/SCBAE	Inh Con (liq)	Head, tachypnea, nau, weak, dizz, confusion, halu, cyan, depres, ST of electrocardiogram, angina, syncope, frostbite	Breath: Art resp	CVS, lungs, blood, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP: ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	CNS depres; nau, vomit; liver, kidney damage; skin irrit; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, eyes, lungs, liver, kidneys, skin
Clothing: Any poss Goggles: Reason prob Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Quick drench	OSHA 5 mg/m³: CCROVDMFu/SA/ SCBA 12.5 mg/m³: SA:CF/PAPROVDMFu 25 mg/m³: CCRFOVHIE/SAF/SCBAF/ PAPRTOVHIE/GMFOVHIE 500 mg/m³: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Blur vision; confusion; atax; delirium; cough; abdom pain, nau, vomit, diarr; irrity; tremor, convuls; anuria	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, eyes, lungs, liver, kidneys, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Chlorinated camphene $C_{10}H_{10}Cl_8$ 8001-35-2 XW5250000 2761 55	Toxaphene	0.5 mg/m³	200 mg/m³	Waxy, amber-colored solid with a mild turpentine-like odor	MW: 414 BP:Decomposes Sol: 0.0003% Fl.P: 275°F	VP: 0.2 to 0.4 mm MP: 158 to 203°F UEL: ? LEL: ?	Strong oxidizers	Filter; petroleum ether; GC; F
Chlorinated diphenyl oxide $C_{12}H_4Cl_6O$ 55720-99-5 KO0875000	Hexachlorodiphenyl oxide	0.5 mg/m³	5 mg/m³	Waxy solid or liquid	MW: 377 BP: 446 to 500°F Sol: 0.1% Fl.P: N.A.	VP: $<6\times10^{-5}$ mm MP: ? UEL: ? LEL: ?	Strong oxidizers	Filter; iso-octane; GC; I
Chlorine Cl_2 7782-50-5 FO2100000 1017 20	None	1 ppm ceil (3 mg/m³) (NIOSH) 0.5 ppm 15-min ceil (1.5 mg/m³) (ACGIH) 1 ppm	25 ppm	Amber liquid or greenish-yellow gas with a characteristic, irritating odor	MW: 71 BP: -29°F Sol: 0.7% Not combustible, but strong oxidizer IP: 11.48 eV	VP: >1 atm MP: -150°F	Combustible substances, finely divided metals	NIOSH 77-157A
Chlorine dioxide ClO_2 10049-04-4 FO3000000 9191 47	None	0.1 ppm (0.3 mg/m³)	10 ppm	Yellow-green to orange gas or liquid with a pungent, sharp odor	MW: 68 BP: 52°F Sol: 0.8% Fl.P: N.A. IP: 10.7 eV	VP: >1 atm MP: -74°F UEL: ? LEL: 10%	Combustible substances, dust, organic matter, sulfur	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: AP liq/RP solid Goggles: Reason prob Wash: Promptly solid/immed liq Change: After work it may be contam solid Remove: Promptly solid/immed liq Provide: Quick drench	OSHA 5 mg/m^3: SA/SCBA/CCROVDMFu 12.5 mg/m^3: SA:CF/PAPROVDMFu 25 mg/m^3: SCBAF/SAF/CCRFOVHiE/PAPRTOVHiE/GMFHiEOV 200 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Nau, confusion, agitation, tremors, convuls, unconscious, dry red skin	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	CNS, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 5 mg/m^3: SA/SCBA Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOVAG/SCBAE	Inh Ing Con	Acneform derm, liver damage	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, liver
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH 5 ppm: CCRS*/SA*/SCBA* 12.5 ppm: SA:CF*/PAPRS* 25 ppm: SCBAF/SAF/CCRFS/GMFS/PAPRTS* Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Con	Burning of eyes, nose, mouth; lac; rhin; cough; chok; nau, vomit; subs pain; head; dizz; syncope; pulm edema, pneu; hypox; derm	Eye: Irr immed Skin: Water flush immed Breath: Art resp	Resp sys
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any contam immed Provide: Eyewash, quick drench	OSHA 2.5 ppm: SA:CF*/PAPRHS* 5 ppm: CCRSF/GMFS/SCBAF/SAF 10 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS*/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; cough, wheez, bron, pulm edema, chronic bron	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Chlorine trifluoride ClF_3 7790-91-2 FO2800000 1749 44	None	0.1 ppm ceil (0.4 mg/m^3)	20 ppm	Greenish-yellow almost colorless liquid or gas with a sweet, irritating odor	MW: 93 BP: 53°F Sol: Reacts Not combustible but highly reactive IP: 13.0 eV	VP: >1 atm MP: -105°F	Combustible substances, water, sand, glass, asbestos, silicon-containing compounds	—
Chloroacetaldehyde $ClCH_2CHO$ 107-20-0 AB2450000 2232 55	2-Chloroethanal, Chloroacetaldehyde (40% aqueous)	1 ppm ceil (3 mg/m^3)	250 ppm	Colorless liquid with a very sharp, irritating odor	MW: 79 BP (748 mm): 185°F Sol: Miscible Fl.P: 190°F (40%) IP: 10.48 eV	VP: 100 mm MP: 3°F (40%) UEL: ? LEL: ?	Oxidizers, acids, water	NIOSH 79-141
alpha-Chloroacetophenone $C_6H_5COCH_2Cl$ 532-27-4 AM6300000 1697 58	Phenacyl chloride, omega-Chloroacetophenone, Chloromethyl phenyl ketone, Phenyl chloromethyl ketone, 'tear gas', CN	0.05 ppm (0.3 mg/m^3)	100 mg/m^3	Colorless to gray solid with a sharp, irritating odor	MW: 154 BP: 477°F Sol: Insoluble Fl.P: 244°F IP: 9.44 eV	VP: 0.012 mm MP: 138°F UEL: N.A. LEL: N.A.	Water, steam	NIOSH 79-141
Chlorobenzene C_6H_5Cl 108-90-7 CZ0175000 1134 27	Monochlorobenzene, Chlorobenzol, Phenyl chloride, MCB	75 ppm (350 mg/m^3) (ACGIH) 75 ppm	2400 ppm	Colorless liquid with a mild aromatic odor	MW: 113 BP: 270°F Sol: 0.1% Fl.P: 84°F IP: 9.07 eV	VP: 8.8 mm MP: -47°F UEL: 7.1% LEL: 1.3%	Strong oxidizers	Char; CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any contam immed Provide: Eyewash, quick drench	OSHA 2.5 ppm: SA:CF$^{\bullet}$ 5 ppm: SCBAF/SAF 20 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	In animals: irrit eyes, resp tract; burns eyes, skin	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Skin, eyes
Clothing: AP ≥ 0.1%/RP <0.1% Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 10 ppm: CCROV$^{\blacktriangle}$/SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 25 ppm: SA:CF$^{\blacktriangle}$/PAPROV$^{\blacktriangle}$ 50 ppm: CCRFOV/GMFOV/SCBAF/SAF 250 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit skin, eyes, muc memb; skin burns; eye damage; pulm edema; skin, resp sens	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work if may be contam Remove: Immed contam non-imperv Provide: Eyewash	OSHA 3 mg/m^3: CCROVDMF 7.5 mg/m^3: SA:CF$^{\bullet}$/PAPROVDM$^{\bullet}$ 15 mg/m^3: CCRFOVHiE/SAF/SCBAF 100 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing Con	Irrit eyes, skin, resp sys; pulm edema	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV$^{\bullet}$/CCRFOV 1875 ppm: SA:CF$^{\bullet}$ 2400 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit skin, eyes, nose; drow, inco; liver damage	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin, CNS, liver

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
o-Chlorobenzylidene malonitrile $C_{10}H_5ClN_2$ 2698-41-1 OO3675000 2647 53	OCBM, CS	0.05 ppm (0.4 mg/m³) (ACGIH) 0.05 ppm ceil (0.4 mg/m³)	2 mg/m³	White solid with a pepper odor	MW: 189 BP: 590 to 599°F Sol: Insoluble	VP: <<1 mm MP: 199 to 203°F MEC: 0.025 g/l	Strong oxidizers	NIOSH 79-141
Chlorobromomethane CH_2BrCl 74-97-5 PA5250000 1887 58	Bromochloromethane, Methylene chlorobromide, CB, CBM, Halon 1011	200 ppm (1050 mg/m³)	5000 ppm	Colorless to pale yellow liquid with a characteristic, sweet odor	MW: 129 BP: 154°F Sol: 0.9% Not combustible	VP: 117 mm MP: -126%	Chemically active metals: calcium, powdered aluminum, zinc, magnesium	Char; CS_2; GC; III
Chlorodiphenyl (42% chlorine) $C_{12}H_7Cl_3$ (approx) 53469-21-9 TQ1356000 2314 31	Polychlorinated biphenyl, PCB	1 mg/m³ (NIOSH) 1.0 μg/m³ 10-hr TWA See Appendix A	10 mg/m³ Ca	Colorless to dark brown liquid with a mild hydrocarbon odor	MW: 258 BP: 617 to 691°F Sol: Insoluble Fl.P: 349°F	VP: 0.001 mm MP: -2°F UEL: ? LEL: ?	Strong oxidizers	Filter/Ads; bub; hexane; GC; III
Chlorodiphenyl (54% chlorine) $C_{12}H_5Cl_5$ (approx) 27323-18-8 TQ1360000 2315 31	Polychlorinated biphenyl, PCB	0.5 mg/m³ (NIOSH) 1.0 μg/m³ 10-hr TWA See Appendix A	5 mg/m³ Ca	Pale yellow, viscous liquid with a mild hydrocarbon odor	MW: 326 BP: 689 to 734°F Sol: Insoluble Fl.P: 432 °F	VP: 0.00006 mm MP: 50°F UEL: ? LEL: ?	Strong oxidizers	Filter/Ads; hexane; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam/daily Change: After work any poss contam Remove: Promptly contam non-imperv	OSHA 2 mg/m^3: SA:CF•/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOVHiE/SCBAE	Inh Ing Con	Pain, burn eyes, lac, conj, eryt eyelids, blepharospasm; irrit throat, cough, chest const; head; eryt vesic skin	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non imperv	OSHA 1000 ppm: PAPROV•/CCRFOV 5000 ppm: SA:CF•/GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Disorient, dizz; irrit eyes, throat, skin; pulm edema	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, liver, kidneys, resp sys, CNS
Clothing: Any poss Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Irrit eyes, chloracne, liver damage, [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Skin, eyes, liver
Clothing: Any poss Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Promptly wet non-imperv	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Irrit eyes, skin; acne-form derm; jaun; dark urine; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Skin, eyes, liver

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Chloroform $CHCl_3$ 67-66-3 FS9100000 1888 55	Trichloromethane	50 ppm (240 mg/m³) (NIOSH) 2 ppm 60-min ceil See Appendix A (ACGIH) 10 ppm, A2	1000 ppm Ca	Colorless liquid with a pleasant, sweet odor	MW: 119 BP: 142°F Sol: 0.8% Not combustible IP: 11.42 eV	VP: 160 mm MP: -82°F	Strong caustics, chemically active metals, such as aluminum, magnesium powder, sodium, potassium	Char; CS_2; GC; III
bis-Chloromethyl ether $O(CH_2Cl)_2$ 542-88-1 KN1575000	Dichloromethylether; BCME; sym-Dichloro-dimethylether; Chloro (chloromethoxy) methane; sym-Dichloromethyl ether; Oxybis (chloromethane); Dimethyl-1,1-dichloroether; Chloromethyl ether; Methane, oxybis (chloro-bis-CHE)	See Appendix C (NIOSH) (ACGIH) 0.001 ppm, A1a (5 μg/m³, A1a)	Ca	Colorless liquid with a suffocating odor	MW: 115 BP: 219°F Sol: Decomposes Fl.P: N.A.	VP: ? MP: -43°F UEL: N.A. LEL: N.A.	Water, unstable	NIOSH 77-157A
Chloromethyl methyl ether $ClCH_2OCH_3$ 107-30-2 KN6650000 300178 1239 28	Methyl chloromethyl ether; Chloromethoxymethane; CMME; Ether, dimethyl chloro; Monochlorodimethylether; Dimethylchloroether; Chlorodimethylether; Methyl chloromethyl ether, anhydrous (DOT)	See Appendix C (NIOSH) (ACGIH) A2	Ca	Clear, colorless liquid	MW: 80.5 BP: 138°F Sol: Decomposes Fl.P: N.A.	VP: ? MP: -154°F UEL: N.A. LEL: N.A.	Water, unstable	NIOSH 77-157A
1-Chloro-1-nitropropane $C_2H_5CHClNO_2$ 600-25-9 TX5075000	None	20 ppm (100 mg/m³) (ACGIH) 2 ppm (10 mg/m³)	2000 ppm	Colorless liquid with an unpleasant odor that causes tears	MW: 124 BP: 285°F Sol: <0.8% Fl.P: 144°F	VP(77°F): 5.8 mm MP: ? UEL: ?	Strong oxidizers	Ads; ethyl acetate; GC; Set 6

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Dizz, mental dullness; nau; head; ftg; anes; hepatomegaly; eye, skin irr; [carc]	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Liver, kidneys, heart, eyes, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Con	Irrit eyes, skin, muc memb of resp sys; pulm congestion, edema; corn damage, nec; reduced pulm function, cough, dysp, wheez; hemoptysis, bronchial secretions; [carc]	Eye: Irr immed (15 min) Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Lungs, eyes, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Con	Irrit eyes, skin, muc memb; pulm edema, pulm congestion, pneu; burns, nec; cough, wheez, pulm congestion; blood stained sputum; weight loss; bronchial secretions; [carc]	Eye: Irr immed (15 min) Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes, mucous membranes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	ACGIH 50 ppm: SA:CF[4]/PAPROV[4] 100 ppm: CCRFOV/GMFOV/SCBAF/SAF 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	In animals: irrit lungs, eyes; liver, kidney, heart, blood vessel damage	Eye: Irr immed Skin: Soap wash Breath: Art resp Swallow: Medical attention immed	In animals: resp sys, liver, kidneys, CVS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Chloropicrin CCl_3NO_2 76-06-2 PB6300000 1580 56	Nitrotrichloromethane, Trichloronitromethane, Nitrochloroform	0.1 ppm (0.7 mg/m^3)	4 ppm	Colorless, oily liquid with a sharp, penetrating odor that causes tears	MW: 164 BP: 234°F Sol: 0.2% Not combustible, but heated material will detonate	VP: 20 mm MP: -83°F	Strong oxidizers	–
Chloroprene $CH_2CClCHCH_2$ 126-99-8 EI9625000 1991 30	2-Chloro-1,3-Butadiene; Chlorobutadiene; beta-Chloroprene	25 ppm (90 mg/m^3) (NIOSH) 1 ppm 15-min ceil See Appendix A (ACGIH) 10 ppm	400 ppm Ca	Colorless liquid with an ether-like odor	MW: 89 BP: 138°F Sol: Insoluble Fl.P: -4°F IP: 8.83 eV	VP: 179 mm MP: -202°F UEL: 20% LEL: 4%	Peroxides, other oxidizers	Char; CS_2; GC; III
Chromic acid and chromates (as CrO_3) H_2CrO_4 7738-94-5 GB2450000 1463 42 1755 60	Synonyms vary depending upon specific compound	0.1 mg/m^3 ceil (NIOSH) 25 µg Cr(VI)/m^3 10-hr TWA 50 µg Cr(VI)/m^3 15-min ceil See Appendix D	30 mg/m^3	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Combustible, organic, or other readily oxidizable materials: paper, wood, sulfur, aluminum, plastics, etc.	Filter; H_2SO_4 & diphenylcarbazide; color; III
Chromium, metal and insoluble salts (as Cr) Cr 7440-47-3 GB4200000	Synonyms vary depending upon specific compound	1 mg/m^3 See Appendix D	500 mg/m^3	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Strong oxidizers	Filter; acid; AA or ICP; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 2.5 ppm: SA:CF*/PAPROV* 4 ppm: SCBAF/SAF/CCRFOV/GMFOV Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Eye irrit, lac; cough, pulm edema; nau, vomit; skin irrit	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Any poss Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, resp sys; ner, irrity; derm, alopecia; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work it may be Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH 0.5 mg/m^3: DMXSQ*/ SA*/SCBA 1.25 mg/m^3: PAPRHiE*/SA:CF* 2.50 mg/m^3: HiEF/SCBAF/SAF/ PAPRTHiE* 30 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Resp, nas septum irrit; leucyt, leupen, monocy, eosin; eye injury, conj; skin ulcer, sens derm	Eye: Irr immed Skin: Soap flush immed Breath: Art resp Swallow: Medical attention immed	Blood, resp sys, liver, kidneys, eyes, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	See Appendix B	Inh Ing	Histologic fibrosis of lungs; Chromium (VI): [carc]	Eye: Irr immed Skin: Soap wash Breath: Art resp Swallow: Medical attention immed	Resp sys

Chromium, metal and insoluble salts (as Cr)

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties	Incompatibilities	Measurement Method (See Tables 1a and 1b)
Chromium, soluble chromic, chromous salts (as Cr) Cr 7440-47-3 GB4200000	Synonyms vary depending upon specific compound	0.5 mg/m³ (NIOSH) See Appendix D	250 mg/m³	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound	Water	Filter; acid; AA or ICP; III
Coal tar pitch volatiles 65996-93-2 GF8655000	Synonyms vary depending upon specific compound	See Appendix D (NIOSH) See Appendix D	400 mg/m³ Ca	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound	Strong oxidizers	NIOSH 77-157-A
Cobalt metal, fume, and dust (as Co) Co 7440-48-4 GF8750000	Synonyms vary depending upon specific compound	0.1 mg/m³	20 mg/m³	Odorless, black solid or finely divided particulates dispersed in air	MW: 59 to 182 BP: 5612°F Sol: Insoluble Fl.P: N.A. VP: 0 mm MP: 2715°F UEL: N.A. LEL: N.A.	Strong oxidizers	Filter; acid; AA or ICP; III
Copper dust and mist (as Cu) Cu 7440-50-8 GL5325000	Synonyms vary depending upon specific compound	1 mg/m³	N.A.	Odorless solids	MW: $CuCO_4$: 250 CuCl: 99 BP: N.A. Sol: $CuSO_4$: 0.006% CuCl: 35% Fl.P: ? VP: N.A. MP: $CuSO_4$: 302°F CuCl: 806°F UEL: ? LEL: ?	Acetylene gas, magnesium metal	Filter; acid; AA; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	OSHA 2.5 mg/m^3: DMXS[d] 5 mg/m^3: DMXSQ[d]/SA[d]SCBA[d] 12.5 mg/m^3: PAPRDM[d]/SA:CF[d] 25 mg/m^3: HiEF/PAPRTHiE[d]/ SCBAF/SAF 250 mg/m^3:SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Ing Con	Sens derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Skin
Clothing: Reason prob Goggles: Reason prob Wash: Daily reason prob Change: After work it may be contam Remove: N.A.	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Con	Derm, bronchitis, [carc]	Eye: Irr immed Skin: Soap wash Breath: Art resp	Resp sys, bladder, kidneys, skin
Clothing: Repeat prolong Goggles: N.A. Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	NIOSH 0.5 mg/m^3: DMXS[c] 1 mg/m^3: DMXSQ[d,c]/DMFu[e]/SA[d]SCBA[d] 2.5 mg/m^3: PAPRDM[d,c]/SA:CF[d]/PAPRDMFu[e] 5 mg/m^3: HiEF/SCBAF/SAF 20 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Cough, dysp, decrease pulm func; low-wgt; derm; diffuse nodular fibrosis, resp hypersensitivity	Eye: Irr immed Skin: Soap wash Breath: Art resp Swallow: Medical attention immed	Resp sys, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 5 mg/m^3: DMXS[d] 10 mg/m^3: DMXSQ[d]/SA[d]/SCBA[d] 25 mg/m^3: PAPRDM[d]/SA:CF[d] 50 mg/m^3: HiEF/SCBAF/SAF/PAPRTHiE[d] 1000 mg/m^3: SA:PD,PP[d] 2000 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit muc memb, pharynx; nas perforation; eye irrit; metal taste; derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, liver, inc risk with Wilson's disease, kidneys

Copper dust and mist (as Cu)

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Copper fume (as Cu) Cu 7440-50-8 GL5325000	Synonyms vary depending upon specific compound	0.1 mg/m^3 (ACGIH) 0.2 mg/m^3	N.A.	Finely divided particulates dispersed in air	MW: 64 to 143 BP: N.A. Sol: Insoluble Fl.P: N.A.	VP: ≅0 mm MP: N.A. UEL: N.A. LEL: N.A.	Acetylene gas	Filter; acid; AA; III
Cotton dust (raw) GN2275000	None	See Appendix D	500 mg/m^3	Colorless, odorless solid	MW: 480,000 BP: Decomposes Sol: Insoluble Fl.P: N.A.	VP: ≅0 mm MP: Decomposes UEL: ? LEL: N.A.	Strong oxidizers	—
Crag® herbicide $C_8H_7Cl_2OOSO_3Na$ 136-78-7 KK4900000	Sesone; Crag® herbicide No. 1; Sodium-2-(2,4-dichloro-phenoxy) ethyl sulfate	15 mg/m^3 (ACGIH) 10 mg/m^3	5000 mg/m^3	Colorless, odorless solid	MW: 309 BP: Decomposes Sol: 25% Not combustible	VP: ≅0 mm MP: 338°F	Strong oxidizers	NIOSH 79-141
Cresol $CH_3C_6H_4OH$ 1319-77-3 GO5950000 2076 55	Cresylic acid; ortho-, meta-, or para-Cresol; 2-,3-, or 4-Methyl phenol	5 ppm ($22 mg/m^3$) (NIOSH) 10 mg/m^3 10-hr TWA	250 ppm	Colorless solid or liquid with a sweet tarry odor	MW: 108 BP: 383 to 446°F Sol: 2.5/2.2/1.9% Fl.P: o-178/m-187/p-187°F IP: 8.93/8.98/8.97 eV	VP: 0.25/0.15/0.1 mm MP: 86/54/95°F UEL: N.A. LEL: 0:300	Strong oxidizers	SiO_2; acetone; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 1 mg/m^3: DMFu/SA/SCBA 2.5 mg/m^3: PAPRDMFu/SA:CF 5 mg/m^3: HiEF/PAPRTHiE/SCBAF/SAF/SAT:CF 100 mg/m^3: SA:PD,PP[A] 200 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con	Metal fume fever: chills, musc ache, nau, fever, dry throat, cough, weak, lass; irrit eyes, upper resp; metal or sweet taste; discolor skin, hair	Breath: Art resp	Resp sys, skin, eyes, inc risk with Wilson's disease
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	NIOSH 1000 $\mu g/m^3$: D 2000 $\mu g/m^3$: DXSQ/SA/HiE/DF 5000 $\mu gm/^3$: PAPRD/SA:CF 10 mg/m^3: HiEF/PAPRTHiE/SCBAF/SAF ΩSCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh	Tight chest, cough, wheez, dysp, decrease FEV, bron; mal; fever, chills; upper resp	Eye: Irr immed Breath: Fresh air	Resp sys, CVS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	ACGIH 50 mg/m^3: DMXS 100 mg/m^3: DMXSQ/SA/SCBA 250 mg/m^3: PAPRDM/SA:CF 500 mg/m^3: HiEF/SCBAF/SAF PAPRTHiE[A]/SAT:CF[A] 5000 mg/m^3: SA:PD,PP[A] Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	None known in humans	Eye: Irr immed Skin: Water wash promptly Breath: Art resp Swallow: Medical attention immed	None known
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH 23 ppm: CCROVDM/SA/SCBA 57.5 ppm: SA:CF/PAPROVDM 115 ppm: CCRFOVHiE/SAF/SCBAF GMFHiEOV/PAPRTHiE[A]/SAT:CF[A] 250 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	CNS effects; conf, depres; resp fail; dysp, irreg rapid resp, weak pulse; skin, eye burns; derm	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, resp sys, liver, kidneys, skin, eyes

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Crotonaldehyde $CH_3CHCHCHO$ 123-73-9 GP9625000 1143 28	beta-Methylacrolein, Propylene aldehyde, Crontonic aldehyde, 2-Butenal	2 ppm (6 mg/m³)	400 mg/m³	Colorless to straw-colored liquid with an irritating, pungent, suffocating odor	MW: 70 BP: 216°F Sol: 15.5% Fl.P: 55°F IP: 9.73 eV	VP: 30 mm MP: -103°F UEL: 15.5% LEL: 2.1%	Caustics, ammonia, organic amines, mineral acids, strong oxidizers	NIOSH 79-141
Cumene $C_6H_5C_3H_7$ 98-28-8 GR8575000 1918 28	Isopropyl benzene, 2-Phenyl propane, Cumol	50 ppm (245 mg/m³)	8000 ppm	Colorless liquid with a sharp, penetrating aromatic odor	MW: 120 BP: 306°F Sol: Insoluble Fl.P: 111°F IP: 8.69 eV	VP: 8 mm MP: -141°F UEL: 6.5% LEL: 0.9%	Oxidizers	Char; CS_2; GC; III
Cyanides (as CN) 1588 55	Synonyms vary depending upon specific compound	5 mg/m³ (NIOSH) 5 mg/m³ 10-min ceil	50 mg/m³	White solid with a faint almond odor	MW: 65/49 BP: ?/2732°F Sol: 72%/58% Not combustible	VP: ≈0 mm MP: 1175/ 1040°F	Strong oxidizers, such as nitrates, chlorates, acids, acid salts	Filter & bub (KOH); OH; ISE; III
Cyclohexane C_6H_{12} 110-82-7 GU6300000 1145 26	Hexahydrobenzene, Hexamethylene, Benzene hexahydride	300 ppm (1050 mg/m³)	10,000 ppm	Colorless liquid with a mild, sweet odor	MW: 84 BP: 177°F Sol: <0.01% Fl.P: -4°F IP: 9.88 eV	VP: 95 mm MP: 44°F UEL: 8.4% LEL: 1.3%	Oxidizers	Char; CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	OSHA 20 ppm: CCROV*/SA*/SCBA* 50 ppm: SA:CF*/PAPROV* 100 ppm: CCRFOV/GMFOV/SCBAF/SAF 400 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, resp sys, skin	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	OSHA 500 ppm: CCROV*/ SA*/SCBA* 1000 ppm: PAPROV*/CCRFOV 1250 ppm: SA:CF* 2500 ppm: GMFOV/SCBAF/SAF 8000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb; head; derm; narco; coma	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, upper resp sys, skin, CNS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH 50 mg/m³: SA/SCBA Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFSHiE/SCBAE	Inh Abs Ing Con	Asphyxia & death can occur; weak; head; confusion; nau, vomit; inco rate resp, slow gasping resp; eye, skin irrit	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CVS, CNS, liver, kidneys, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV*/CCRFOV 7500 ppm: SA:CF* 10,000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Ing Inh Con	Irrit eyes, resp sys; drowsy; derm; narco, coma; dizz; nau	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin, CNS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Cyclohexanol $C_6H_{11}OH$ 108-93-0 GV7875000	Hexalin, Hydralin, Hydroxycyclohexane, Anol, Hexahydrophenol, Cyclohexyl alcohol	500 ppm (200 mg/m³)	3500 ppm	Colorless, viscous liquid or sticky solid with a faint camphor odor	MW: 100 BP: 322°F Sol: 3.6% Fl.P: 154°F IP: 10 eV	VP: 1 mm MP: 75°F UEL: ? LEL: 2.4%	Strong oxidizers	Char; 2-Propanol in CS_2; GC
Cyclohexanone $C_6H_{10}O$ 108-94-1 GW1050000 1915 26	Pimelic ketone, Cyclohexyl ketone	50 ppm (200 mg/m³) (NIOSH) 25 ppm (100 mg/m³) 10-hr TWA (ACGIH) 25 ppm	5000 ppm	Water-white to slightly yellow liquid with a peppermint-like odor	MW: 98 BP: 314°F Sol: 15% Fl.P: 111°F IP: 9.14 eV	VP: 2 mm MP: -53°F UEL: ? LEL: (212°F): 1.1%	Oxidizing agents, nitric acid	Char; CS_2; GC; III
Cyclohexene C_6H_{10} 110-83-8 GW2500000 2256 29	Benzene tetrahydride	300 ppm (1015 mg/m³)	10,000 ppm	Colorless liquid with a sweetish odor	MW: 82 BP: 181°F Sol: Very low Fl.P: 10°F IP: 8.95 eV	VP: 67 mm MP: -155°F UEL: (212°F): 5% LEL: 1%	Strong oxidizers	Char; CS_2; GC; III
Cyclopentadiene C_5H_6 542-92-7 GY1000000	1,3-Cyclopentadiene	75 ppm (200 mg/m³)	2000 ppm	Colorless liquid with a sweet odor like turpentine; dimer crystalline, camphor-like odor	MW: 66 BP: 107°F Sol: Insoluble Fl.P: (oc):<90°F IP: 8.57 eV	VP: ? MP: -121°F UEL: ? LEL: ?	Strong oxidizers	NIOSH 79-141

		Health Hazards			
Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contan Change: N.A. Remove: Promptly contam non-imperv	OSHA 500 ppm: CCROV$^{\blacktriangle}$/SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 1000 ppm: PAPROV$^{\blacktriangle}$/CCRFOV 1250 ppm: SA:CF$^{\blacktriangle}$ 2500 ppm: GMFOV/SCBAF/SAF 3500 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; narcosis; irrit skin	Eye: Irr immed Skin: Water wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 625 ppm: SA:CF$^{\blacktriangledown}$/PAPROV$^{\blacktriangledown}$ 1000 ppm: CCRFOV 1250 ppm: GMFOV/SCBAF/SAF 5000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb; CNS, narcosis; skin	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV$^{\blacktriangledown}$/CCRFOV 7500 ppm: SA:CF$^{\blacktriangledown}$ 10,000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit, skin, eyes, resp sys; drow	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 750 ppm: CCROV/SA/SCBA 1000 ppm: PAPROV/CCRFOV/PAPRTOV 1875 ppm: SA:CF 2000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
2,4,-D $C_8H_6Cl_2O_3$ 94-75-7 AG6825000 2765 55	2,4-Dichlorophenoxy-acetic acid	10 mg/m³	500 mg/m³	Colorless, odorless solid	MW: 221 BP: Decomposes Sol: 0.07 ppm Fl.P: ?	VP: ≈0 mm MP: 284 °F UEL: ? LEL: ?	Strong oxidizers	Filter; CH_3OH; HPLC; III
DDT $C_{14}H_9Cl_5$ 50-29-3 KJ3325000 2761 55	p,p'-DDT; 2,2-bis(p-Chlorophenyl)-1,1,1-trichloroethane; Dichlorodiphenyl-trichloroethane	1 mg/m³ (NIOSH) lowest detectable limit (0.5 mg/m³ TWA by NIOSH-validated method) See Appendix A	Ca	Colorless solid with a weak, chemical odor	MW: 355 BP: Decomposes Sol: 0.00001 Not combustible	VP: 1.7 × 10⁻⁷ mm MP: 228 °F	Strong oxidizers	Filter; iso-octane; GC; S
Decaborane $B_{10}H_{14}$ 17702-41-9 HD1400000 1868 34	None	0.05 ppm (0.3 mg/m³)	20 ppm	Colorless solid with a pungent odor	MW: 122 BP: 415 °F Sol: Insoluble Fl.P: 176 °F IP: 10.6 eV	VP(77 °F): 0.05 mm MP: 212 °F UEL: ? LEL: ?	Oxidizers, water, halogenated compounds	—
Demeton® $C_8H_{19}O_3PS_2$ $OC_2H_4SC_2H_5)_2$ 8065-48-3 TF3150000	Systox® ; o,o-Diethyl o-(2-ethylthio)ethyl phosphoro-thioate mixture; demeton-o	0.1 mg/m³	20 mg/m³	Light brown liquid with an odor of sulfur compounds	MW: 258 BP(2 mm): 273 °F Sol: 0.2% Fl.P: ?	VP: Very low MP: -13 °F UEL: ? LEL: ?	Strong oxidizers	NIOSH 80-125

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF: PD,PP/SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Weak, stupor, hyporeflexia, musc twitch, convuls, derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Pares tongue, lips, face; tremor; appre, dizz, conf, mal; head; convuls; paresis hands; vomit; irrit eyes, skin; [carc]	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	CNS, kidneys, liver, skin, PNS
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam/daily Change: After work it may be contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 0.5 ppm: SA/SCBA 1.25 ppm: SA:CF 2.5 ppm: SAF/SCBAF/SAT:CF 20 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Dizz, head, nau, li-head, drow, inco, local musc spas, tremor, convuls, ftg	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 1 mg/m^3: SA/SCBA 2.5 mg/m^3: SA:CF 5 mg/m^3: SCBAF/SAF/SAT:CF 20 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP: ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Miosis, ache eyes; rhin; head; chest, wheez, lar spas; salv; cyan; anor; nau, vomit, abdom cramp, diarr; local sweat; musc fasc; para; dizz; atax; convul; low BP; card	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CVS, CNS, skin, eyes, blood cholinesterase

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READEX FICHE

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Diacetone alcohol $(CH_3)_2C(OH)CH_2COCH_3$ 123-42-2 SA9100000 1148 26	Diacetone, 4-Hydroxy-4-methyl-2-pentanone, 2-Methyl-2-pentanol-4-one	50 ppm (240 mg/m^3) (NIOSH) 50 ppm (240 μg/m^3) 10-hr TWA	2100 ppm	Colorless liquid with a mild odor	MW: 116 BP: 328°F Sol: Miscible Fl.P: 136°F	VP: 0.8 mm MP: -45°F UEL: 6.9% LEL: 1.8%	Strong oxidizers and alkalies	Char; 2-Propanol in CS_2; GC; III
Diazomethane CH_2N_2 334-88-3 PA7000000	Azimethylene, Diazirine	0.2 ppm (0.4 mg/m^3)	10 ppm	Yellow gas, or liquid under pressure	MW: 42 BP: -9°F Sol: Reacts Fl.P: N.A. IP: 8.99 eV	VP: N.A. MP: -229°F UEL: ? LEL: ?	Alkali metals, drying agents such as calcium sulfate	Resin; CS_2; GC; J
Diborane B_2H_6 19287-45-7 HQ9275000 1911 18	Boroethane	0.1 ppm (0.1 mg/m^3)	40 ppm	Colorless gas with a repulsive, sweet odor	MW: 28 BP: -134°F Sol: Reacts Fl.P: ? IP: 11.4 eV	VP: > atm MP: -265°F UEL: 98% LEL: 0.8%	Air, halogenated compounds, aluminum, lithium, active metals, oxidized surfaces	NIOSH 82-100
*Dibromochloropropane (see page 240)								
Dibutyl phosphate $(C_4H_9O)_2(OH)PO$ 107-66-4 TB9605000	Dibutyl acid o-phosphate, Di-n-butyl hydrogen phosphate, Dibutyl phosphoric acid	1 ppm (5 mg/m^3)	125 ppm	Colorless to brown, odorless liquid	MW: 210 BP: >212°F Sol: Insoluble Fl.P: ?	VP: <<1 mm MP: ? UEL: ? LEL: ?	Strong oxidizers	NIOSH 79-141

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			Health Hazards	
		Route	Symptoms (See Table 4)	First Aid (See Table 5)		Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	NIOSH 1000 ppm: CCRFOV/PAPROV* 1250 ppm: SA:CF* 2100 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; corneal tissue damage, narcosis; skin irrit	Eye: Skin: Breath: Swallow:	Irr immed Water flush promptly Art resp Medical attention immed	Eyes, skin, resp sys
Clothing: Prevent contam or freezing Goggles: Any poss Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash	OSHA 2 ppm: SA[4]/SCBA[4] 5 ppm: SA:CF[4] 10 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF: PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Cough, short breath; head; flush skin, fever; chest pain, pulm edema, pneumonitis; irrit eyes; asthma	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Art resp Medical attention immed	Resp sys, eyes, skin
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 1 ppm: SA/SCBA 2.5 ppm: SA:CF 5 ppm: SCBAF/SAF/SAT:CF 40 ppm: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Con	Tight chest, precordial pain, short breath, nonproductive cough; nau; head; li-head, verti; chills, fever; ftg; weak, tremor, musc fasc	Eye: Breath:	Irr immed Art resp	Resp sys, CNS
*Dibromochloropropane (see page 241)						
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv Provide: Quick drench	OSHA 10 ppm: SA/SCBA 25 ppm: SA:CF 50 ppm: SCBAF/SAF/SAT:CF 125 ppm: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP: ASCBA Escape: GMFHIEOV/SCBAE	Inh Ing Con	Resp irrit; head; irrit skin, eyes, nose	Eye: Skin: Breath: Swallow:	Irr immed Soap wash promptly Art resp Medical attention immed	Resp sys, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Dibutylphthalate $C_6H_4(CO_2C_4H_9)_2$ 84-74-2 TI0875000	DBP; Dibutyl; 1,2,-Benzene-dicarboxylate	5 mg/m³	9300 mg/m³	Colorless, oily liquid with a very weak, aromatic odor	MW: 278 BP: 635°F Sol: 0.45% Fl.P: 315°F	VP: <0.01 mm MP: -35°F UEL: ? LEL: 0.5% (at Fl.P)	Nitrates; strong oxidizers, alkalies, and acids	Filter; CS_2; GC; D
o-Dichlorobenzene $C_6H_4Cl_2$ 95-50-1 CZ4500000 1591 58	1,2-Dichlorobenzene; o-Dichlorobenzol	50 ppm ceil (300 mg/m³)	1700 ppm	Colorless to pale yellow liquid with a pleasant, aromatic odor	MW: 147 BP: 356°F Sol: 0.015% Fl.P: 151°F IP: 9.06 eV	VP: 1.2 mm MP: 0.5°F UEL: 9.2% LEL: 2.2%	Strong oxidizers, hot aluminum or aluminum alloys	Char; CS_2; GC; J
p-Dichlorobenzene $C_6H_4Cl_2$ 106-46-7 CZ4550000 1592 58	1,4-Dichlorobenzene; Dichloricide; PDCB	75 ppm (450 mg/m³)	1000 ppm	Colorless solid with a mothball-like odor	MW: 147 BP: 345°F Sol: 0.008% Fl.P: 150°F IP: 8.94 eV	VP: 0.4 mm MP: 127°F UEL: ? LEL: 2.5%	None hazardous	Char; CS_2; GC; T
3,3'-Dichlorobenzidine (and its salts) $C_{12}H_{10}Cl_2N_2$ 91-94-1 DD0525000 800004	Dichlorobenzidine base; o,o'-Dichlorobenzidine; 3,3'-Dichlorobiphenyl-4,4'-diamine; 3,3'-Dichloro-4,4'-biphenyldiamine; DCB; 4,4'-Diamino-3,3'-Dichlorobiphenyl; 3,3'-Dichloro-4,4'-diaminobiphenyl	See Appendix C (NIOSH)	Ca	Gray to purple crystalline solid	MW: 253 BP: ? Sol: Almost insoluble Fl.P: N.A.	VP: ? MP: 271°F UEL: N.A. LEL: N.A.	Not available	NIOSH 77-157A

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3))	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: N.A. Goggles: Reason prob Wash: N.A. Change: N.A. Remove: N.A.	OSHA 50 mg/m^3: DMF 125 mg/m^3: PAPRDM▾/SA:CF▾ 250 mg/m^3: HiEF/SCBAF/SAF 9300 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP: ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit nasal passages, upper resp, stomach; light sensitivity	Eye: Irr immed Skin: Wash regularly Breath: Art resp Swallow: Medical attention immed	Resp sys, GI tract
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	OSHA 1000 ppm: PAPROV▾/CCRFOV 1250 ppm: SA:CF▾ 1700 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit nose, eyes; liver, kidney damage; skin blister	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Liver, kidneys, skin, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Reason prob daily Change: N.A. Remove: N.A.	OSHA 1000 ppm: SA:CF▾/PAPROV▾/ CCRFOV/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF: PD,PP: ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Head; eye irrit, swell periorbital; profuse rhinitis; anor, nau, vomit; low-wgt; jaun, cirr	Eye: Irr immed Skin: Soap wash Breath: Art resp Swallow: Medical attention immed	Liver, resp sys, eyes, kidneys, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh Abs Ing Con	Allergic skin reaction, sens; head; dizz; caustic burns; frequent urination, dys; hema; GI upsets; upper resp infection; derm; [carc]	Eye: Irr immed (15 min) Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Bladder, liver, lung, skin, GI tract

3,3'-Dichlorobenzidine (and its salts)

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Dichlorodifluoromethane CCl_2F_2 75-71-8 PA8200000 1028 12	Refrigerant 12, Freon 12, Propellant 12, Halon 122	1000 ppm (4950 mg/m³)	50,000 ppm	Colorless gas with a characteristic ether-like odor at >20% by volume	MW: 121 BP: -22°F Sol: 0.008% Not combustible IP: 11.97 eV	VP: 5.7 atm MP: -252°F	Chemically active metals: sodium, potassium, calcium, powdered aluminum, zinc, magnesium	Char; CH_2Cl_2; GC; Set 1
1,3-Dichloro-5,5-dimethylhydantoin $C_5H_6Cl_2N_2O_2$ 118-52-5 MU0700000	Halane, Dactin	0.2 mg/m³	5 mg/m³	White solid with a chlorine-like odor	MW: 197 BP: ? Sol: 0.2% Fl.P: 346°F	VP: ? MP: 266°F UEL: ? LEL: ?	Water, strong acids, easily oxidized materials, such as ammonia salts, sulfides, etc.	—
1,1-Dichloroethane CH_3CHCl_2 75-34-3 KI0175000 2362 27	Asymmetrical Dichloroethane, Ethylidene chloride; 1,1-Ethylidene dichloride	100 ppm (400 mg/m³) (ACGIH) 200 ppm (810 mg/m³)	4000 ppm	Colorless liquid with a chloroform-like odor	MW: 99 BP: 135°F Sol: <0.1% Fl. P: 17°F	VP: 182 mm MP: -142°F UEL: 16% LEL: 6%	Strong oxidizers and caustics	Char; CS_2; GC; III
1,2-Dichloroethylene ClCHCHCl 540-59-0 KV9360000 1150 29	Acetylene dichloride, cis-Acetylene dichloride, Dioform, trans-Acetylene dichloride, sym-Dichloroethylene	200 ppm (790 mg/m³)	4000 ppm	Colorless liquid with an ether-like, slightly acrid odor, like chloroform	MW: 97 BP: 113 to 140°F Sol: 0.35 to 0.63% Fl.P: 36 to 39°F IP: 9.65 eV	VP: 180 to 265 mm MP: -56 to 115°F UEL: 12.8% LEL: 9.7%	Strong oxidizers	Char; CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Prevent wet or freeze Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	OSHA 10,000 ppm: SA/SCBA 25,000 ppm: SA:CF 50,000 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con	Dizz, tremors, unconscious, card arrhy, card arrest	Eye: Irr immed Skin: Water flush immed Breath: Art resp	CVS, PNS
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv Provide: Eyewash	OSHA 2 mg/m^3: SA/SCBA 5 mg/m^3: SA:CF/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFSHIE/SCBAE	Inh Ing Con	Irrit eyes, muc memb, resp sys	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: SA/SCBA 2500 ppm: SA:CF 4000 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	CNS depres; skin irrit; drow; unconscious; liver, kidney damage	Eye: Irr immed Skin: Soap flush promptly Breath: Art resp Swallow: Medical attention immed	Skin, liver, kidneys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV•/CCRFOV 4000 ppm: SA:CF•/GMFCOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, resp sys; CNS depression	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, CNS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Dichloroethyl ether $(ClCH_2CH_2)_2O$ 111-44-4 KN0875000 1916 57	bis(2-Chloroethyl)ether; 2,2-Dichloro-diethylether	15 ppm ceil (90 mg/m^3) (ACGIH) 5 ppm (30 mg/m^3)	250 ppm	Colorless liquid with a chlorinated solvent-like odor	MW: 143 BP: 353°F Sol: 1.1% Fl.P: 131°F	VP: 0.4 mm MP: -62°F UEL: ? LEL: ?	Strong oxidizers	Char; CS_2; GC; III
Dichloromono-fluoromethane $CHCl_2F$ 75-43-4 PA8400000 1029 12	Refrigerant 21, Freon 21, Halon 112, Dichlorofluoromethane	1000 ppm (4200 mg/m^3) (ACGIH) 10 ppm (40 mg/m^3)	50,000 ppm	Colorless liquid or gas with a slight ether-like odor	MW: 103 BP: 48°F Sol: 1% Not combustible IP: 12.39 eV	VP: ? MP: -211°F	Chemically active metals: sodium, potassium, calcium, powdered aluminum, zinc, magnesium	Char; CS_2; GC; Set 1
1,1-Dichloro-1-nitroethane $CH_3CCl_2NO_2$ 594-72-9 KI1050000 2650 57	None	10 ppm ceil (60 mg/m^3) (ACGIH) 2 ppm (10 mg/m^3)	150 ppm	Colorless liquid with an unpleasant odor; causes tears	MW: 144 BP: 257°F Sol: 0.25% Fl.P: 136°F	VP: 15 mm MP: ? UEL: ? LEL: ?	Strong oxidizers	Char (pet); CS_2; GC; III
Dichlorotetra-fluoroethane $F_2ClCCClF_2$ 76-14-2 KI1101000 1958 12	1,2-Dichlorotetra-fluoroethane; Freon 114; Refrigerant 114; Halon 242	1000 ppm (7000 mg/m^3)	50,000 ppm	Colorless liquid or gas with a very slight, ethereal odor	MW: 171 BP: 38°F Sol: 0.01% Not combustible	VP: 1444 mm MP: -137°F	Chemically active metals: sodium, potassium, calcium, powdered aluminum, zinc, magnesium	Char; CH_2Cl_2; GC; Set 1

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	ACGIH 50 ppm: SA[*]/SCBA[*] 125 ppm: SA:CF[*] 250 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Lac; irrit nose, throat, cough; nau, vomit	Eye: Irr immed Skin: Soap wash Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Any poss wet Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed	ACGIH 100 ppm: SA/SCBA 250 ppm: SA:CF 500 ppm: SCBAF/SAF 10,000 ppm: SA:PD,PP 20,000 ppm: SAT:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Asphyxia, card arrhy, card arrest	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CVS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 20 ppm: SA/SCBA 50 ppm: SA:CF 100 ppm: SAF/SCBAF 150 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	In animals: irrit lungs; liver, heart, kidney, blood vessel damage	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Lungs
Clothing: Any poss wet Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed	OSHA 10,000 ppm: SA/SCBA 25,000 ppm: SA:CF 50,000 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Resp irrit, asphyxia; card arrhy, card arrest	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CVS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Dichlorvos $(CH_3O)_2POOCHCCl_2$ 62-73-7 TC0350000 2783 55	DDVP; 2,2-Dichlorovinyl dimethyl phosphate	1 mg/m³	200 mg/m³	Colorless to amber liquid with a mild, chemical odor	MW: 221 BP: (1 mm): 170°F Sol: ≅ 1% Not combustible	VP(90°F): 0.032 mm MP: ?	None hazardous	NIOSH 79-141
Dieldrin $C_{12}H_8Cl_6O$ 60-57-1 IO1750000 2761 55	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-exo-5,8-di-methanonaphthalene	0.25 mg/m³ (NIOSH) Lowest detectable limit (0.15 mg/m³ TWA by NIOSH-validated method) See Appendix A	450 mg/m³ Ca	Colorless to light tan solid with a mild, chemical odor	MW: 381 BP: Decomposes Sol: 110 ppb Not combustible	VP: 1.8 x 10^{-7} mm MP: 349°F	Strong oxidizers, active metals like sodium, strong acids, phenols	Filter; iso-octane; GC; T
Diethylamine $(C_2H_5)_2NH$ 109-89-7 HZ8750000 1154 68	None	25 ppm (75 mg/m³) (ACGIH) 10 ppm (30 mg/m³)	2000 ppm	Colorless liquid with a fishy odor like ammonia	MW: 73 BP: 132°F Sol: Miscible Fl.P: < 0°F IP: 8.01 eV	VP: 195 mm MP: -58°F UEL: 10.1% LEL: 1.8%	Strong oxidizers and acids	SiO_2; H_2SO_4 in CH_3OH; GC; J
Diethylaminoethanol $(C_2H_5)_2NC_2H_4OH$ 100-37-8 KK5075000 2686 29	2-Diethylaminoethyl alcohol; N,N-Diethylethanolamine; Diethyl-(2-hydroxyethyl)amine; 2-Diethylamino ethanol	10 ppm (50 mg/m³)	500 ppm	Colorless liquid with a weak, ammonia odor	MW: 117 BP: 324°F Sol: Miscible Fl.P: 126°F	VP: 1 mm MP: ? UEL: 11.7% LEL: 6.7%	Strong oxidizers and acids	NIOSH 79-141

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv	OSHA 10 mg/m^3: SA/SCBA 25 mg/m^3: SA:CF 50 mg/m^3: SAF/SCBAF/SAT:CF 200 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Miosis, ache eyes; rhin; head; chest, wheez, lar spas; salv; cyan; anor, nau, vomit, diarr; sweat; musc fasc, para, atax; convul; low BP; card	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CVS, CNS, eyes, skin, blood cholinesterase
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Head; dizz; nau, vomit, mal; sweat; myoclonic limbjerks; clonic, tonic convul; coma; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, liver, kidneys, skin
Clothing: Any poss (liq) Goggles: AP > 0.5%/RP ≤ 0.5% Wash: Immed upon contam (liq) Change: N.A. Remove: Any wet immed (flamm) Provide: > 0.5% Eyewash/liq quick drench	ACGIH 250 ppm: SA:CF$^{\blacktriangledown}$/PAPRS$^{\blacktriangledown}$ 500 ppm: GMFS/SCBAF/SAF/CCRSF 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Eye, skin, resp irrit	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Reason prob Goggles: AP>5% soln/RP <5% Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash (≥ 5% soln), quick drench	OSHA 100 ppm: CCROV$^{\blacktriangle}$/SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 250 ppm: SA:CF$^{\blacktriangle}$/PAPROV$^{\blacktriangle}$ 500 ppm: CCRFOV/PAPRTOV$^{\blacktriangle}$/GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Nau, vomit; irrit resp, skin, eye	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Difluorodibromomethane CBr_2F_2 75-61-6 PA7525000 1941 58	Dibromodifluoromethane, Freon 12B2	100 ppm (860 mg/m^3)	2500 ppm	Colorless liquid or gas with a characteristic odor	MW: 210 BP: 76°F Sol: Insoluble Not combustible IP: 11.07 eV	VP: 620 mm MP: -233°F	Chemically active metals: sodium, potassium, calcium, powdered aluminum, zinc, magnesium	Char; isopropyl alcohol; GC; H
Diglycidyl ether $C_6H_{10}O_3$ 2238-07-5 KN2350000	di(Epoxyproply)ether; bis (2,3-Epoxypropyl)-ether; 2-Epoxypropyl ether; Diallyl ether dioxide; DGE	0.5 ppm (2.8 mg/m^3) (NIOSH) 1 mg/m^3 15-min ceil (0.2 ppm) See Appendix A (ACGIH) 0.1 ppm	85 ppm Ca	Colorless liquid with a strong, irritant odor	MW: 130 BP: 500°F Sol: ? Fl.P: ?	VP(77°F): 0.09 mm MP: ? UEL: ? LEL: ?	Strong oxidizers	—
Diisobutyl ketone $((CH_3)_2CHCH_2)_2CO$ 108-83-8 MJ5775000 1157 26	2,6-Dimethyl-4-heptanone; sym-Diisopropylacetone; Isovalerone; Valerone	50 ppm (290 mg/m^3) (NIOSH) 25 ppm 10-hr TWA (ACGIH) 25 ppm (150 mg/m^3)	2000 ppm	Colorless liquid with a mild odor	MW: 142 BP: 335°F Sol: 0.05% Fl.P: 140°F	VP: 1.7 mm MP: -43°F UEL: 6.2% LEL: 0.8%	Strong oxidizers	Char; CS_2; GC; III
Diisopropylamine $(CH_3)_2CHNHCH(CH_3)_2$ 108-18-9 IM4025000 1158 68	None	5 ppm (20 mg/m^3)	1000 ppm	Colorless liquid with an odor like ammonia	MW: 101 BP: 183°F Sol: Miscible <81°F Fl.P: 20°F IP: 7.73 eV	VP: 60 mm MP: -141°F UEL: 7.1% LEL: 0.8%	Strong oxidizers, strong acids	NIOSH 77-157A

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Promptly wet non-imperv	OSHA 1000 ppm: SA/SCBA 2500 ppm: SA:CF/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Frostbite; irrit nose, throat; drow; unconscious; liver damage	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Skin, resp sys
Clothing: Any poss Goggles: Reason prob Wash: Immed upon contam/daily Change: After work any poss contam Remove: Immed contam non-imperv Provide: Quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, resp sys; skin burns; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys
Clothing: Repeat prolong Goggles: N.A. Wash: Promptly upon wet Change: N.A. Remove: Promptly contam non-imperv	NIOSH 625 ppm: SA:CF▾/PAPROV▾ 1000 ppm: CCROVF 1250 ppm: GMFOV/SCBAF/SAF 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; head; dizz; derm; unconscious	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Repeat prolong Goggles: Any poss (soln ≥ 5%) Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash (soln ≥ 5%)	OSHA 125 ppm: SA:CF▾/PAPROV▾ 250 ppm: CCRFOV/GMFOV/SCBAF/SAF 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Ing Inh Abs Con	Nau, vomit; head; eye irrit, visual disturbance; pulm irrit	Eye: Irr immed Skin: Water wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Dimethyl acetamide $CH_3CON(CH_3)_2$ 127-19-5 AB7700000	N,N-Dimethyl acetamide; DMAC	10 ppm (35 mg/m³)	400 ppm	Colorless liquid with a faint, ammonia-like odor	MW: 87 BP: 331°F Sol: Miscible Fl.P(oc): 150°F IP: 8.81 eV	VP: 1.5 mm MP: -4°F UEL: 11.5% LEL: 1.8%	Carbon tetrachloride; other halogenated compounds, when in contact with iron	SiO_2; CH_3OH; GC; R
Dimethylamine $(CH_3)_2NH$ 124-40-3 IP8750000 72TI6689 1032 19	Dimethylamine, anhydrous	10 ppm (18 mg/m³)	2000 ppm	Colorless liquid or gas with a pungent, fishy, or ammonia-like odor	MW: 45 BP: 44°F Sol: Very soluble Fl.P: N.A. IP: 8.24 eV	VP: 1.7 atm MP: -134°F UEL: 14.4% LEL: 2.8%	Strong oxidizers, chlorine, mercury	$SiO_2H_2SO_4$ in CH_3OH; GC; J
4-Dimethylaminoazobenzene $C_{14}H_{15}N_3$ 60-11-7 BX7350000 8300188	N,N-dimethyl-4-aminoazobenzene; N,N-Dimethyl-4-(phenylazo)-benzenamine; p-Dimethylaminoazobenzene; Methyl yellow; Butter yellow; DAB; N,N-Dimethyl-p-phenylazoaniline	See Appendix C (NIOSH)	Ca	Yellow, crystalline leaflets	MW: 225 BP: Sublimes Sol: Insoluble Fl.P: N.A.	VP: ? MP: 240°F UEL: N.A. LEL: N.A.	Not available	NIOSH 77-157A
Dimethylaniline $C_6H_5N(CH_3)_2$ 121-69-7 BX4725000 2253 57	N,N-Dimethylaniline	5 ppm (25 mg/m³)	100 ppm	Straw- to brown-colored liquid with a characteristic amine-like odor	MW: 121 BP: 379°F Sol: 1.6% Fl.P: 145°F IP: 7.14 eV	VP: <1 mm MP: 36°F UEL: ? LEL: 1%	Strong oxidizers, strong acids	Char; CS_2; GC; L

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	OSHA 100 ppm: SA/SCBA 250 ppm: SA:CF 400 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Jaun, liver damage; depres, lethargy, halu, delusions; irrit skin	Eye: Irr immed Skin: Water flush immed Swallow: Medical attention immed	Liver, skin
Clothing: AP liq/RP sol Goggles: Any poss Wash: Upon contam liq imm/soln pro Change: N.A. Remove: Any wet immed (flamm) Provide: Liq: eyewash, quick drench	OSHA 250 ppm: SA:CF* 500 ppm: SCBAF/SAF 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Ing Inh Con	Irrit eyes, throat; sneez, cough, dysp; pulm edema; conj; burns skin, muc memb; derm	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Enlarged liv, hep and renal dysfunction, contact derm, cough, wheez, difficulty breathing, bloody sputum, bronchial secretions, frequent urination, hema, dys, [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Liver, skin, bladder
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	OSHA 50 ppm: SA/SCBA 100 ppm: SA:CF/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Cyan, weak, dizz, ataxia	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Blood, kidneys, liver, CVS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Dimethyl-1,2-dibromo-2,2-dichlorethyl phosphate $C_4H_7O_4PBr_2Cl_2$ 300-76-5 TB9450000 2783 55	Naled; 1,2-Dibromo-2,2,dichloro-ethyl dimethyl phosphate; Dibrom	3 mg/m³	1800 mg/m³	Colorless solid or straw-colored liquid with a slightly pungent odor	MW: 381 BP: Decomposes Sol: Insoluble Not combustible	VP: 0.0002 mm MP: 81°F	Strong oxidizers	—
Dimethyl formamide $HCON(CH_3)_2$ 68-12-2 LQ2100000 2265 26	N,N-Dimethyl formamide; DMF	10 ppm (30 mg/m³)	3500 ppm	Colorless liquid with a faint, ammonia-like odor	MW: 73 BP: 307°F Sol: Miscible Fl.P: 136°F IP: 9.12 eV	VP: 2.7 mm MP: -78°F UEL: 15.2% LEL: 2.2%	Carbon tetrachloride; other halogenated compounds, when in contact with iron; strong oxidizers; alkyl aluminums	SiO_2; CH_3OH; GC; R
1,1-Dimethylhydrazine $(CH_3)_2NNH_2$ 57-14-7 MV2450000 1163 28	Unsymmetrical Dimethylhydrazine, UDMH	0.5 ppm (1 mg/m³) (NIOSH) 0.15 mg/m³ 120-min ceil See Appendix A (ACGIH) 0.5 ppm, A2	50 ppm Ca	Fuming, colorless liquid with an amine-like odor	MW: 60 BP: 146°F Sol: Miscible Fl.P: 5°F IP: 7.46 eV	VP: 103 mm MP: -71°F UEL: 95% LEL: 2%	Oxidizers, halogens, metallic mercury, fuming nitric acid, hydrogen peroxide	Bub (HCl); Phosphomolybdic acid; color; K
Dimethylphthalate $C_{10}H_{10}O_4$ 131-11-3 TI1575000	DMP	5 mg/m³	9300 mg/m³	Colorless, oily liquid with a slight ester odor	MW: 194 BP: 545°F Sol: 0.04% Fl.P: 295°F IP: 9.75 eV	VP(212°F): 1 mm MP: 32 to 36°F UEL. ? LEL: 1.2% (at Fl.P)	Nitrates, strong oxidizers, alkalies, and acids	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Any poss Wash: Immed upon contam Change: After work it may be contam Remove: Immed contam non-imperv Provide: Eyewash	OSHA 30 mg/m^3: DMFu/SA/HiE/SCBA 75 mg/m^3: PAPRDMFu/SA:CF 150 mg/m^3: HiEF/PAPRTHiE/SAT:CF/SCBAF/SAF 1800 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Miosis, eye irrit; head; tight chest, wheez; lar spas; salv; cyan; anor, nau, abdom cramp, diarr; weak, twitch, para, gidd, atax, convul; low BP; card	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CNS, CVS, skin, eyes, blood cholinesterase
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	OSHA 100 ppm: CCROV[4]/SA[4]/SCBA[4] 250 ppm: SA:CF[4]/PAPROV[4] 500 ppm: SCBAF/SAF/GMFOV/CCRFOV/SAT:CF 3500 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Nau, vomit, colic; liver damage, hepatomegaly; high BP; face flush; derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Liver, kidneys, CVS, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Irrit eyes; choking, chest pain, dysp; lethargy; nau; irrit skin; anoxia; convuls; liver injury; [carc]	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, liver, GI tract, blood, resp sys, eyes, skin
Clothing: N.A. Goggles: Reason prob Wash: N.A. Change: N.A. Remove: N.A.	OSHA 50 mg/m^3: DMF 125 mg/m^3: PAPRDM/SA:CFM 250 mg/m^3: HiEF/SCBAF/SAF 9300 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Ing Inh Con	Irrit nasal passages, upper resp, stomach; eye pain	Eye: Irr promptly Skin: Regularly Breath: Art resp Swallow: Medical attention immed	Resp sys, GI tract

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Dimethylsulfate $(CH_3)_2SO_4$ 77-78-1 WS8225000 1595 57	Methyl sulfate	1 ppm (5 mg/m^3) (ACGIH) 0.1 ppm, A2 (0.5 mg/m^3, A2)	10 ppm	Colorless, oily liquid with a faint onion odor	MW: 126 BP: 372°F Sol: 2.8% Fl.P: 182°F	VP: 0.5 mm MP: -25°F UEL: ? LEL: ?	Strong oxidizers and ammonia solutions	NIOSH 79-141
Dinitrobenzene (all isomers) $C_6H_4(NO_2)_2$ 528-29-0 CZ7450000 1597 56	o-Dinitrobenzene, 1,2-Dinitrobenzene; m-Dinitrobenzene, 1,3-Dinitrobenzene; p-Dinitrobenzene, 1,4-Dinitrobenzene	1 mg/m^3	200 mg/m^3	Pale yellow solid	MW: 168 BP: 604/572/586°F Sol: 0.015%/0.05%/0.01% Fl.P: Explodes	VP: <<1 mm MP: 243/194/343°F UEL: ? LEL: ?	Strong oxidizers, caustics, metals, such as tin, zinc	Filter/Bub (ethylene glycol); CH_3OH; HPLC; Set 4
Dinitro-o-cresol $CH_3C_6H_2OH(NO_2)_2$ 534-52-1 GO9625000 1598 53	3,5-Dinitro-2-hydroxytoluene; 4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methyl-phenol; DNOC; DN	0.2 mg/m^3 (NIOSH) 0.2 mg/m^3 10-hr TWA	5 mg/m^3	Yellow solid	MW: 198 BP: ? Sol: 0.01% Fl.P: None	VP: 0.00005 mm MP: 187°F MEC: 0.03 g/l	Strong oxidizers	Filter/Bub (ethylene glycol); 2-proponal; HPLC; Set 6
Dinitrotoluene $C_6H_3CH_3(NO_2)_2$ 25321-14-6 XT1300000 1600 56 2038 56	DNT	1.5 mg/m^3	200 mg/m^3	Orange-yellow solid (often shipped molten) with a characteristic odor	MW: 182 BP: 482°F Sol: 0.03% Fl.P: 404°F	VP: 1 mm MP: 158°F UEL: ? LEL: ?	Strong oxidizers, caustics, metals, such as tin, zinc	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	ACGIH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat; head; gidd; photo; periorb edema; dysphonia, aphonia, dysphagia cough, chest pain; cyan; vomit; diarr dys; ict, album hema	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, liver, kidneys, CNS, skin
Clothing: Reason prob Goggles: Reason prob Wash: Immed wet/promptly contam Change: After work it may be contam Remove: Immed wet/pro contam non-imperv Provide: Quick drench	OSHA 5 mg/m^3: DMXS 10 mg/m^3: DMXSQ/SA/HiE/SCBA 25 mg/m^3: PAPRDM/SA:CF 50 mg/m^3: HiEF/PAPRTHiE/ SCBAF/SAF/SAT:CF 200 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Anoxia, cyan; vis dist, central scotomas; bad taste, burning mouth, dry throat; yellowing hair, eyes, skin; anemia	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Blood, liver, CVS, eyes, CNS
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon contam/ daily Change: After work it may be contam Remove: Promptly contam non-imperv	NIOSH 2 mg/m^3: DMF 5 mg/m^3: PAPRDM▾/SA:CF▾/ HIEF/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Sense of well being, head, fever, lass, profuse sweat, excess thirst, tacar, hyperpnea, cough, short breath, coma	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CVS, endocrine sys, eyes
Clothing: AP molten/RP liq Goggles: Any poss molten Wash: Immed wet/pro contam/ daily Change: After work it may be contam Remove: Immed wet/pro contam non-imperv Provide: Quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAT:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Anoxia, cyan, anemia, jaundice	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Blood, liver, CVS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Di-sec-octyl phthalate $C_{24}H_{38}O_4$ 117-81-7 TI0350000	DOP, bis-(2-Ethylhexyl) phthalate, Di-2-Ethylhexyl phthalate, DEHP	5 mg/m³ (NIOSH) Reduce exposure to lowest feasible limit See Appendix A	Ca	Colorless, oily liquid with almost no odor	MW: 390 BP: 727°F Sol: 0.005% Fl.P(oc): 425°F	VP: < 0.01 mm MP: -51°F UEL: ? LEL: ?	Nitrates; strong oxidizers, acids, and alkalides	Filter; CS_2; GC; D
Dioxane $OCH_2CH_2OCH_2CH_2$ 123-91-1 JG8225000 1165 26	Diethylene dioxide; Diethylene ether; Dioxan; p-Dioxane; 1,4-Dioxane	100 ppm (360 mg/m³) (NIOSH) 1 ppm 30-min ceil See Appendix A (ACGIH) 25 ppm	200 ppm Ca	Colorless liquid with a mild ether-like odor	MW: 88 BP: 214°F Sol: Miscible Fl.P: 54°F IP: 9.13 eV	VP: 29 mm MP: 53°F UEL: 22% LEL: 2%	Strong oxidizers	Char; CS_2; GC; G
Diphenyl $C_6H_5C_6H_5$ 92-52-4 DU8050000	Biphenyl, Phenyl benzene	0.2 ppm (1 mg/m³) (ACGIH) 0.2 ppm (1.5 mg/m³)	300 mg/m³	Colorless to pale yellow solid with a very characteristic odor	MW: 154 BP: 489°F Sol: Insoluble Fl.P: 235°F IP: 8.27 eV	VP: Very low MP: 156°F UEL(311°F): 5.8% LEL(212°F): 0.6%	Oxidizers	Tenax; CCl_4; GC; Set 4
Dipropylene glycol methyl ether $C_7H_{16}O_3$ 34590-94-8 JM1575000	Dipropylene glycol monomethyl ether, Dowanol 50B	100 ppm (600 mg/m³)	N.A.	Colorless liquid with a weak odor	MW: 148 BP: 374°F Sol: Miscible Fl.P: 185°F	VP: 0.3 mm MP: -117°F UEL: ? LEL: ?	Strong oxidizers	Char; CS_2; GC; F

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards				
		Route	Symptoms (See Table 4)	First Aid (See Table 5)		Target Organs
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	NIOSH Ξ: SAF:PD,PP:ASCBA/SCBAF:PD/PP Escape: HiEF/SCBAE	Inh Con Ing	Irrit eyes, muc memb; nau; diarr; [carc]	Eye: Skin: Breath: Swallow:	Irr immed Wash regularly Art resp Medical attention immed	Eyes, upper resp sys, GI tract
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Drow, head; nau, vomit; irrit eyes, nose, throat; liver damage; kidney failure; skin irrit; [carc]	Eye: Skin: Breath: Swallow:	Irr immed Water wash promptly Art resp Medical attention immed	Liver, kidney, skin, eyes
Clothing: Repeat prolong Goggles: AP molten/RP otherwise Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 10 mg/m³: CCROVDM/SA/SCBA 25 mg/m³: SA:CF/PAPROVDM[4] 50 mg/m³: CCRFOVHiE/SAF/SCBAF/GMFHiEOV/PAPRTOVHiE[4] 300 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Irrit throat, eyes; head; nau; ftg; numb limbs; liver damage	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Art resp Medical attention immed	Liver, skin, CNS, upper resp, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 1000 ppm: SA/SCBA 2500 ppm: SA:CF 5000 ppm: SCBAF/SAF/SAT:CF Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing Con	Irrit eyes, nose; weak, lihead, head	Eye: Skin: Breath: Swallow:	Irr immed Wash promptly Art resp Medical attention immed	Resp sys, eyes

Dipropylene glycol methyl ether

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Endrin $C_{12}H_8Cl_6O$ 72-20-8 I01575000 2761 55	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-endo-5,8-dimethano-naphthalene	0.1 mg/m³	200 mg/m³	Colorless to tan solid with a mild chemical odor	MW: 381 BP: Decomposes Sol: 160 ppb Not combustible, but may be dissolved in flammable solvent	VP: $2x10^{-7}$ mm	Strong oxidizers and acids	NIOSH 80-125
Epichlorohydrin C_3H_5OCl 106-89-8 TX4900000 2023 30	1-Chloro-2,3-epoxy-propane; 2-Chloropropylene oxide; gamma-Chloropropylene oxide	5 ppm (19 mg/m³) (NIOSH) Lowest feasible limit See Appendix A (ACGIH) 2 ppm	100 ppm Ca	Colorless liquid with an irritating, chloroform-like odor	MW: 93 BP: 239°F Sol: 6.4% Fl.P: 100°F IP: 10.64 eV	VP: 13 mm MP: -72°F UEL: 21% LEL: 3.8%	Strong oxidizers and acids, caustics, zinc, aluminum, chlorides of iron and aluminum	Char; CS_2; GS; III
EPN $C_{14}H_{14}NO_4PS$ 2104-64-5 TB1925000	o-Ethyl o-p-nitrophenyl thionobenzene phosphonate, o-Ethyl o-p-nitrophenyl benzenephonothioate	0.5 mg/m³	50 mg/m³	Yellow solid or brown liquid	MW: 323 BP: ? Sol: Insoluble Not combustible	VP(212°F): 0.0003 mm MP: 97°F	Strong oxidizers	Filter; iso-octane; GC; III
Ethanolamine $HOCH_2CH_2NH_2$ 141-43-5 KJ5775000 2491 29	Ethylolamine, Monoethanolamine, beta-Aminoethyl alcohol, 2-Aminoethanol, 2-Hydroxethylamine	3 ppm (6 mg/m³) (ACGIH) 3 ppm (8 mg/m³)	1000 ppm	Colorless liquid with a mild ammonia-like odor; solid below 51°F	MW: 61 BP: 338°F Sol: Miscible Fl.P: 185°F	VP: < 1 mm MP: 51°F UEL: ≅17% LEL: 5.5%	Strong oxidizers and acids	NIOSH 78-175

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 1 mg/m^3: CCROVDMFu/SA/SCBA 2.5 mg/m^3: SA:CF/PAPROVDMFu 5 mg/m^3: CCRFOVHiE/SAF/SCBAF/ GMFOVHiE/PAPRTOVHiE/SAT:CF 100 mg/m^3: SA:PD,PP 200 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Epileptiform convul, stupor, head, dizz, abdom discomfort, nau, vomit, insom, aggressive confusion, lethargy, weak, anor	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, liver
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH Ξ: SCBA:PD,PP SAF:PD,PP:ASCBA Escape: GMFOVAG/SCBAE	Inh Abs Ing Con	Nau, vomit; abdom pain; resp distress, cough; cyan; irrit eyes, skin with deep pain; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, lungs, skin, kidneys
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 5 mg/m^3: SA/SCBA 12.5 mg/m^3: SA:CF 25 mg/m^3: SAF/SCBAF/SAT:CF 50 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Miosis, irrit eyes; rhin; head; tight chest, wheez, lar spas; salv; cyan; anor, nau, abdom cramp, diarr; para convul; low BP; card	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CVS, CNS, eyes, skin, blood cholinesterase
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv Provide: Eyewash	OSHA 30 mg/m^3: SA^4/$SCBA^4$/$CCRS^4$ 75 ppm: SA:CF/$PAPRS^4$ 150 ppm: CCRSF/GMFS/SAF/SCBAF 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	Resp sys, skin, eye irrit; lethargy	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
2-Ethoxyethanol $C_2H_5OCH_2CH_2OH$ 110-80-5 KK8050000 1171 26	Ethylene glycol monoethyl ether, Cellosolve® solvent	200 ppm (740 mg/m³) (NIOSH) lowest feasible limit (ACGIH) 5 ppm (19 mg/m³)	6000 ppm	Colorless liquid with a sweetish odor	MW: 90 BP: 275°F Sol: Miscible Fl.P(oc): 120°F	VP: 4 mm MP: -94°F UEL: 14% LEL: 1.8%	Strong oxidizers	Char; CH_3OH in CS_2; GS; III
2-Ethoxyethylacetate $C_2H_5OCH_2CH_2OOCH_3$ 111-15-9 KK8225000 1172 26	Cellosolve® acetate, Glycol monoethyl ether acetate, Ethylene glycol monoethyl ether acetate	100 ppm (540 mg/m³) (ACGIH) 5 ppm (27 mg/m³)	2500 ppm	Colorless liquid with a mild, non-residual odor	MW: 132 BP: 313°F Sol: 23% Fl.P: 117°F	VP: 2 mm MP: -80°F UEL: ? LEL: 1.7%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; III
Ethyl acetate $CH_3COOC_2H_5$ 141-78-6 AH5425000 1173 26	Acetic ester, Acetic ether, Ethyl enthanoate	400 ppm (1400 mg/m³)	10,000 ppm	Colorless liquid with a pleasant, fruity odor	MW: 88 BP: 171°F Sol: 8.7% Fl.P: 24°F	VP: 76 mm MP: 117°F UEL: 11% LEL: 2.2%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; E
Ethylamine $C_2H_5NH_2$ 75-04-7 KH2100000 1036 68	Ethylamine, anhydrous; Aminoethane; Monoethylamine	10 ppm (18 mg/m³)	4000 ppm	Colorless liquid or gas with a strong ammonia-like odor	MW: 45 BP: 62°F Sol: Miscible Fl.P.: < 0°F IP: 8.86 eV	VP: 1.18 atm MP: -114°F UEL: 14% LEL: 3.5%	Strong acids and oxidizers	SiO_2; H_2SO_4 ultrasonic; GC; K

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	In animals: hematologic effects; liver, kidneys, lung damage, irrit eyes	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	In animals: lungs, eyes, blood, kidneys, liver
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	ACGIH 50 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 125 ppm: SA/CF$^{\blacktriangle}$ 250 ppm: SCBAF/SAF 2500 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con Ing	Irrit eyes, nose; vomit; kidney damage; paralysis	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, GI tract
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: CCRFOV$^{\blacktriangledown}$/PAPROV$^{\blacktriangledown}$ 10,000 ppm: GMFOV/SAF/SCBAF/SA:CF$^{\blacktriangledown}$ Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; narcosis; derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Reason prob Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed any wet/contam non-imperv Provide: Eyewash, quick drench	OSHA 250 ppm: SA:CF$^{\blacktriangledown}$/PAPRS$^{\blacktriangledown}$ 500 ppm: CCRSF/GMFS/SCBAF/SAF 4000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Irrit eyes, burns skin, resp irrit, derm	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin

Ethylamine

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Ethyl acrylate $CH_2CHCOOC_2H_5$ 140-88-5 AT0700000 1917 27	Ethyl propenoate	25 ppm (100 mg/m³) (ACGIH) 5 ppm (20 mg/m³)	2000 ppm	Colorless liquid with a sharp, acrid odor	MW: 100 BP: 277°F Sol: 1.5% Fl.P: 48°F	VP: 29.5 mm MP: -103°F UEL: ? LEL: 1.8%	Oxidizers, peroxides, polymerizers, strong alkalies, moisture	Char; CS_2; GC; III
Ethyl benzene $C_2H_5C_6H_5$ 100-41-4 DA0700000 1175 26	Phenylethane, Ethylbenzol	100 ppm (435 mg/m³)	2000 ppm	Colorless liquid with an aromatic odor	MW: 106 BP: 211°F Sol: 0.015% Fl.P: 59°F IP: 8.76 eV	VP: 7.1 mm MP: -139°F UEL: 6.7% LEL: 1.0%	Strong oxidizers	Char; CS_2; GC; III
Ethyl bromide C_2H_5Br 74-96-4 KH6475000 1891 58	Bromoethane	200 ppm (890 mg/m³)	3500 ppm	Colorless to yellow liquid with an ether-like odor	MW: 109 BP: 100°F Sol: 0.9% Fl.P: < -4°F IP: 10.29 eV	VP: 375 mm MP: -182°F UEL: 11.3% LEL: 6.7%	Chemically active metals: sodium, potassium, calcium powdered aluminum, zinc, magnesium	Char; isopropyl alcohol; GC; H
Ethyl butyl ketone $C_2H_5COC_4H_9$ 106-35-4 MJ5250000	Butyl ethyl ketone, 3-Heptanone	50 ppm (230 mg/m³)	3000 ppm	Colorless liquid with a mild, fruity odor	MW: 114 BP: 297°F Sol: 0.43% Fl.P(oc): 115°F IP: 9.15 eV	VP: 4 mm MP: -36°F UEL: 8.8% LEL: 1.4%	Oxidizers	Char; CH_3OH/CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	ACGIH 50 ppm: SA$^{\Delta}$/SCBA$^{\Delta}$/CCROV$^{\Delta}$ 125 ppm: SA:CF$^{\Delta}$/PAPROV$^{\Delta}$ 250 ppm: CCRFOV/GMFOV/SCBAF/SAF/ PAPRTOV$^{\Delta}$ 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, resp sys, skin	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV$^{\Delta}$/SA$^{\Delta}$/ SCBA$^{\Delta}$/CCROV$^{\Delta}$ 2000 ppm: GMFOV/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb; head; derm; narco, coma	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, upper resp sys, skin, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 2000 ppm: SA/SCBA 3500 ppm: SA:CF/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, resp sys; CNS depress; irrit skin; pulm edema; liver, kidney disease; card arrhy, card arrest; dizz	Eye: Irr immed Skin: Soap flush promptly Breath: Art resp Swallow: Medical attention immed	Skin, liver, kidneys, resp sys, CVS, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	OSHA 500 ppm: CCROV$^{\Delta}$/SA$^{\Delta}$/ SCBA$^{\Delta}$ 1000 ppm: PAPROV$^{\Delta}$/CCRFOV 1250 ppm: SA:CF$^{\Delta}$ 2500 ppm: GMFOV/SCBAF/SAF 3000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb; head; narco, coma; derm	Eye: Irr immed Skin: Water flush Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Ethyl chloride C_2H_5Cl 75-00-3 KH7525000 1037 27	Chloroethane, Monochloroethane, Hydrochloric ether, Muriatic ether	1000 ppm (2600 mg/m³)	20,000 ppm	Colorless liquid or gas with a pungent, ether-like odor	MW: 65 BP: 54°F Sol: 0.6% Fl.P: -58°F IP: 10.97 eV	VP: 1064 mm MP: -218°F UEL: 15.4% LEL: 3.8%	Chemically active metals; sodium, potassium, calcium, powdered aluminum	Char (2); CS_2; GC; Set 4
Ethylene chlorohydrin CH_2ClCH_2OH 107-07-3 KK0875000 1135 55	2-Chloroethanol, 2-Chloroethyl alcohol	5 ppm (16 mg/m³) (ACGIH) 1 ppm ceil (3 mg/m³)	10 ppm	Colorless liquid with an ether-like odor	MW: 81 BP: 266°F Sol: Miscible Fl.P: 140°F IP: 10.90 eV	VP: 5 mm MP: -81°F UEL: 15.9% LEL: 4.9%	Strong oxidizers and caustics	Char; Isopropyl alcohol in CS_2; GC; H
Ethylenediamine $NH_2CH_2CH_2NH_2$ 107-15-3 KH8575000 1604 29	1,2-Diaminoethane; Ethylenediamine, anhydrous; 1,2-Ethanediamine	10 ppm (25 mg/m³)	2000 ppm	Colorless liquid or solid with an ammonia-like odor	MW: 60 BP: 242°F Sol: Miscible Fl.P: 93°F	VP: 10 mm MP: 52°F UEL: 11.1% LEL: 5.8%	Strong acids and oxidizers, chlorinated organic compounds	NIOSH 72-175
Ethylene dibromide CH_2BrCH_2Br 106-93-4 KH9275000 1605 55	1,2-Dibromoethane; Ethylene bromide	20 ppm 30 ppm ceil 50 ppm, 5-min peak (NIOSH) Ca 0.045 ppm, 8-hr TWA 0.13 ppm, 15-min ceil See Appendix A (ACGIH) A2	400 ppm	Colorless liquid or solid with a mild sweet odor	MW: 188 BP: 268°F Sol: 0.4% Not combustible IP: 9.45 eV	VP: 11 mm MP: 50°F	Chemically active metals: sodium, potassium, calcium, powdered aluminum, zinc, magnesium; liquid ammonia; strong oxidizers	Char; C_6H_6/CH_3OH GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards: Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	OSHA 10,000 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 20,000 ppm: SA:CF$^{\blacktriangle}$/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Inco, inebriate; abdom cramps; card arrhy, card arrest; liver, kidney damage	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Liver, kidneys, resp sys, CVS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	ACGIH 10 ppm: SCBA$^{\blacktriangle}$/SA$^{\blacktriangle}$ Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit muc memb; nau, vomit; vertigo, inco; numb, vision disturb; head; thirst; delirium; low BP; collapse, shock, coma	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, liver, kidneys, CNS, skin, CVS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work any poss contam Remove: Any wet/contam non-imperv imm Provide: Eyewash (>5%) quick drench	OSHA 250 ppm: SA:CF$^{\blacktriangledown}$/PAPRS$^{\blacktriangledown}$ 500 ppm: CCRSF/GMFS/SCBAF/SAF 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Nasal irrit; primary irrit; sens derm; irrit resp sys, asth; liver, kidney damage	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, liver, kidneys, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit resp sys, eyes; derm with vesiculation; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, liver, kidneys, skin, eyes

Ethylene dibromide

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Ethylene dichloride $ClCH_2CH_2Cl$ 107-06-02 KI0525000 1184 26	Ethylene chloride; 1,2-Dichloroethane; Glycol dichloride	50 ppm 100 ppm ceil 200 ppm peak (NIOSH) 1 ppm, 10-hr TWA 2 ppm, 15-min ceil See Appendix A (ACGIH) 10 ppm	1000 ppm Ca	Clear liquid with a sweet odor like chloroform	MW: 99 BP: 183°F Sol: 0.8% Fl.P: 55°F IP: 9.64 eV	VP: 62 mm MP: -32°F UEL: 16% LEL: 6.2%	Strong oxidizers and caustics, chemically active metals, such as aluminum or magnesium powder, sodium, potassium	Char; CS_2; GC; III
Ethylene glycol dinitrate $C_2H_4(NO_3)_2$ 628-96-6 KW5600000 and/or Nitroglycerin $C_3H_5(NO_3)_3$ 55-63-0 QX2100000	Glycol dinitrate, Nitroglycol Blasting gelatin, Glycerin trinitrate, EGDN	1 mg/m³ ceil (NIOSH) 0.1 mg/m³ 20-min ceil (ACGIH) 0.05 ppm	80 ppm	Colorless to yellow, oily liquids; nitroglycerin is a solid at <55°F	MW: 152/227 BP: 237/293°F Explodes Sol: 0.52/0.17% Fl.P: Explodes	VP: 0.05/ 0.0015 mm MP: -9/53°F	Acids	Tenax; CH_3CH_2OH; GC;
Ethyleneimine C_2H_5N 151-56-4 KX5075000 1185 30	Ethyleimine; Dimethylenimine; Dihydroazirine; Azirane; Aziridine; Aminoethylene; Azacyclopropane; 1H-Azirine, dihydro-; Dihydro-1H-azirine; Dimethyleneimine; Ethylimine	See Appendix C (NIOSH) (ACGIH) 0.5 ppm (1 mg/m³)	Ca	Colorless volatile liquid with intense odor of ammonia	MW: 43 BP: 131 to 132°F Sol: Infinitely soluble Fl.P: 12°F	VP: 160 mm MP: 108°F UEL: 46% LEL: 3.3%	Polymerizes explosively in presence of oxidizing materials	NIOSH 77-157A
Ethylene oxide C_2H_4O 75-21-8 KX2450000 1040 60	Dimethylene oxide; 1,2-Epoxy ethane; Oxirane	1 ppm (1.8 mg/m³) (NIOSH) <0.1 ppm, 8-hr TWA 5 ppm, 10-min ceil See Appendix A (ACGIH) 1 ppm, A2	800 ppm Ca	Colorless liquid or gas with an ether-like odor, irritating at high concentrations	MW: 44 BP: 51°F Sol: Miscible Fl.P: <0°F IP: 10.56 eV	VP: 1095 mm MP: -171°F UEL: 100% LEL: 3%	Even small amounts of strong acids, alkalies, oxidizers; catalytic anhydrous chlorides of iron, aluminum, tin; oxides of iron; aluminum	Char; CS_2; GC; T

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Abs Con	CNS depression; nau, vomit; derm; irrit eyes, corneal opacity; [carc]	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow Medical attention immed	Kidneys, liver, eyes, skin, CNS
Clothing: Any poss Goggles: Reason prob Wash: Immed upon contam Change: After work any poss contam Remove: Any wet immed (flamm) Provide: Quick drench	NIOSH 0.2 ppm: SA$^{\pounds}$/SCBA$^{\pounds}$ 0.5 ppm: SA/CF$^{\pounds}$ 1 ppm:SCBAF/SAF 20 ppm: SA:PD,PP$^{\pounds}$ 40 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Throb head; dizz; nau, vomit, abdom pain; hypotens; flush; palp; methemoglobinemia; delirium, depres CNS; angina; skin irrit	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CVS, blood, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Con Ing	Nau, vomit; head; dizz; pulm edema; liv and kid damage; eye burns; skin sens; nose and throat irrit; [carc]	Eye: Irr immed (15 min) Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, lungs, skin, liver, kidneys
Clothing: Any poss Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	Irrit eyes, nose, thoat; peculiar taste; head; nau, vomit, diarr; dysp; cyan; pulm edema; drow, weak, inco; EKG abnormalities; burns eyes, skin; frostbite; [carc]	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, blood, resp sys, liver, CNS, kidneys

Ethylene oxide

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Ethyl ether $C_2H_5OC_2H_5$ 60-29-7 KI5775000 1155 26	Diethyl ether, Ethyl oxide, Ether, Diethyl oxide, Solvent ether	400 ppm (1200 mg/m³)	19,000 ppm	Colorless liquid with a characteristic, sweet, ether odor	MW: 74 BP: 95°F Sol: 7.5% Fl.P: -49°F IP: 9.53 eV	VP: 442 mm MP: -190°F UEL: 36% LEL: 1.9%	Strong oxidizers	Char; Ethylacetate; GL; F
Ethyl formate $HCOOC_2H_5$ 109-94-4 LQ8400000 1190 26	Ethyl methanoate, Formic acid ethyl ester	100 ppm (300 mg/m³)	8000 ppm	Colorless liquid with a fruity odor	MW: 74 BP: 130°F Sol: 13.6% Fl.P: -4°F IP: 10.61 eV	VP: 194 mm MP: -110°F UEL: 16% LEL: 2.8%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; D
Ethyl mercaptan C_2H_5SH 75-08-1 KI9625000 2363 27	Ethanethiol, Ethyl sulfhydrate	10 ppm ceil (25 mg/m³) (NIOSH) 0.5 ppm 15-min ceil (1.3 mg/m³) (ACGIH) 0.5 ppm	2500 ppm	Colorless liquid with a strong skunk-like odor	MW: 62 BP: 95°F Sol: 1.3% Fl.P: -55°F IP: 9.28 eV	VP: 442 mm MP: -234°F UEL: 18% LEL: 2.8%	Strong oxidizers	—
n-Ethylmorpholine $C_6H_{13}ON$ 100-74-3 QE4025000	4-Ethylmorpholine	20 ppm (94 mg/m³) (ACGIH) 5 ppm (23 mg/m³)	2000 ppm	Colorless liquid with an ammonia-like odor	MW: 115 BP: 281°F Sol: Miscible Fl.P: 90°F	VP: 5 mm MP: -81°F UEL: 9.8% LEL: 1.0%	Strong acids and oxidizers	SiO_2; H_2SO_4 ultrasonic; GC; K

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: CCROV$^{\blacktriangle}$/PAPROV$^{\blacktriangle}$ 4000 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 10,000 ppm: SA:CF$^{\blacktriangle}$ 19,000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Dizz; drow; head, excited, narcosis; nau, vomit; irrit eyes, upper resp, skin	Eye: Irr immed Skin: Water wash promptly Breath: Art resp Swallow: Medical attention immed	CNS, skin, resp sys, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 1000 ppm: CCRFOV/PAPROV$^{\blacktriangledown}$ 2500 ppm: SA:CF$^{\blacktriangledown}$ 5000 ppm: GMFOV/SCBAF/SAF 8000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, resp sys; narcosis	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	NIOSH 5 ppm: SA/SCBA/CCROV 12.5 ppm: SA:CF/PAPROV 25 ppm: SCBAF/SAF/GMFOV/PAPRTOV/ CCRFOV/SAT:CF 500 ppm: SA:PD,PP 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Head; nau; irrit muc memb, throat; in animals: inco; para; pulm irrit; liver, kidney damage	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys; in animals: liver, kidneys
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash (>15%) quick drench	ACGIH 50 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$/CCROV$^{\blacktriangle}$ 125 ppm: SA:CF$^{\blacktriangle}$/PAPROV$^{\blacktriangle}$ 250 ppm: SCBAF/SAF/CCRFOV/GMFOV/ PAPRTOV$^{\blacktriangle}$/SAT:CF$^{\blacktriangle}$ 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Eye, nose, throat irrit; vis dist; severe eye irrit from splashes	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin

n-Ethylmorpholine

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Ethyl silicate $(C_2H_5)_4SiO_4$ 78-10-4 VV9450000 1292 29	Ethyl silicate, condensed; Tetraethyl silicate; Ethyl orthosilicate; Tetraethoxysilane	100 ppm (850 mg/m³) (ACGIH) 10 ppm (85 mg/m³)	1000 ppm	Colorless liquid with a mild, sweet, alcohol-like odor	MW: 208 BP: 336°F Sol: Reacts Fl.P: 99°F	VP: 2 mm MP: -121°F UEL: 23% LEL: 1.3%	Strong oxidizers, water	Resin; CS_2; GC; S
Ferbam $((CH_3)_2NCS_2)_3Fe$ 14484-64-1 NO8750000	Ferric dimethyl dithiocarbamate, tris(Dimethyl-dithio-carbamate) iron	15 mg/m³ (ACGIH) 10 mg/m³	N.A.	Odorless, black solid	MW: 417 BP: Decomposes Sol: 0.01%	VP: ≅0 mm MP: Decomposes MEC: 0.055 g/l	Strong oxidizers	—
Ferrovanadium dust 12604-58-9 LK2900000	None	1 mg/m³ (NIOSH) 1 mg/m³ 10-hr TWA as vanadium	500 mg/m³	Dark, odorless solid particles	MW: N.A. BP: N.A. Sol: Insoluble Fl.P: N.A.	VP: ≅0 mm MP: N.A. MEC: 1.3 g/m³	Strong oxidizers	—
Fluorides (as F) F 16984-48-8 LM6290000	Synonyms vary depending upon specific compound	2.5 mg/m³ (NIOSH) 2.5 mg/m³ 10-hr TWA	500 mg/m³	Appearance and odor vary depending upon specific compounds	Properties vary depending upon specific compounds		Strong acids	Filters (2); NIOSH; ISE; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	ACGIH 100 ppm: SA[4]/SCBA[4] 250 ppm: SA:CF[4] 500 ppm: SAF/SCBAF 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, liver, kidneys, blood, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	ACGIH 50 mg/m³: DXS 100 mg/m³: DXSQ[4]/SA[4]/ SCBA[4]/HiE[4] 250 mg/m³: PAPRD[4]/SA:CF[4] 500 mg/m³: HiEF/SCBAF/SAF PAPRTHiE[4]/SAT:CF[4] 7500 mg/m³: SA:PD,PP[4] Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit eyes, resp tract; derm; GI dist	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, GI tract
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	NIOSH 5 mg/m³: DM[4] 10 mg/m³: DMXSQ[4]/SA[4]/SCBA[4] 25 mg/m³: PAPRDM[4]/SA:CF[4] 50 mg/m³:HiEF/SCBAF/SAF/PAPRTHiE[4]/ SAT:CF[4] 500 mg/m³: SAF:PD,PP[4] Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con	Irrit eyes, resp sys	Eye: Irr immed Breath: Art resp	Resp sys, eyes
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon contam Change: After work any poss contam Remove: Promptly contam non-imperv	NIOSH 12.5 mg/m³: DMXS 25 mg/m³: DMXSQ[4]/SA[4]/SCBA[4] 62.5 mg/m³: PAPRDM[4]*/SA:CF[4] 125 mg/m³: SCBAF/HiEF*/SAF 500 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEAG/SCBAE *NOTE: MAY NEED ACID GAS SORBENT	Inh Ing Con	Irrit eyes, resp sys; nau, abdom pain, diarr; excess salv, thirst, sweat; stiff spine; derm; calcification of ligaments of ribs, pelvis	Eye: Irr immed Skin: Soap wash promptly Breath: Fresh air, art resp Swallow: Medical attention immed	Eyes, resp sys, CNS, skeleton, kidneys, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Fluorine F_2 7782-41-4 LM6475000 1045 20 9192 25	None	0.1 ppm (0.2 mg/m^3) (ACGIH) 1 ppm (2 mg/m^3)	25 ppm	Pale yellow gas with a pungent, irritating odor	MW: 38 BP: -307°F Sol: Reacts Not combustible, but strong oxidizer IP: 15.69 eV	VP: >1 atm MP: -363°F UEL: ? LEL: ?	Water, nitric acid, most oxidizable materials	—
Fluorotrichloromethane CCl_3F 75-69-4 PB6125000 1078 12	Refrigerant 11, Monofluorotrichloromethane, Trichlorofluoromethane, Trichloromonofluoromethane, Freon 11	1000 ppm (5600 mg/m^3) (ACGIH) 1000 ppm ceil (5600 mg/m^3)	10,000 ppm	Colorless liquid or gas with a chlorinated solvent odor which is detectable >20% by volume	MW: 137 BP: 75°F Sol: 0.11% Not combustible IP: 11.77 eV	VP: 690 mm MP: -168°F	Chemically active metals: sodium, potassium, calcium, powdered aluminum, zinc, magnesium	Char; CS_2; GC; Set 1
Formaldehyde HCHO 50-00-0 LP8925000 1198 29 2209 29	1) Methylene oxide; 2) Formalin, methanol free (30 to 50% formaldehyde); 3) Formalin, stabilized, N.F. (6 to 15% methanol)	3 ppm 5 ppm ceil 10 ppm 30-min ceil (NIOSH) Lowest feasible limit See Appendix A (ACGIH) 1 ppm, A2	100 ppm Ca	Colorless liquid or gas with a pungent odor	MW: 30 BP: 3/214/206°F Sol: Miscible Fl.P: N.A./185/122°F IP: 10.88 eV	VP: N.A./1/1.3 mm MP:-180/N.A./N.A./°F UEL: 73% LEL: 7%	Strong oxidizers, alkalies, and acids; phenols; urea	Ads; iso-octane; GC; III
Formic acid HCOOH 64-18-6 LQ4900000 1779 60	1) Formic acid 85%; 2) Formic acid 90%; 3) Formic acid 95%; Hydrogencarboxylic acid; Methanoic acid	5 ppm (9 mg/m^3)	100 ppm	Colorless liquid, may be fuming with a pungent, penetrating odor	MW: 46 BP: 224/225/226°F Sol: Miscible Fl.P: N.A./185/122°F IP: 11.05 eV	VP: 23 to 33 mm MP: 4.5/20/35°F UEL: 57% LEL: 18%	Strong oxidizers, strong caustics, concentrated sulfuric acid	NIOSH 79-141

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 1.0 ppm: SA[*]/SCBA[*] 2.5 ppm: SA:CF[*] 5 ppm: SCBAF/SAF 25 ppm: SA:PD,PP[*] Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS[‡]/SCBAE	Inh Con	Irrit eyes, nose, resp tract; lar spas, bron spas, pulm edema; eyes, skin burns; in animals: liver, kidney damage	Eye: Irr immed Skin: Water flush immed Breath: Art resp	Resp sys, eyes, skin; in animals: liver, kidneys
Clothing: Repeat prolong Goggles: Any poss Wash: N.A. Change: N.A. Remove: Promptly wet non-imperv Provide: Eyewash, quick drench	OSHA 10,000 ppm: SA/SCBA Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Inco, tremors, derm, frostbite, card arrhy, card arrest	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CVS, skin
Clothing: Reason prob Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Ing Con	Irrit eyes, nose, throat; lac; burns nose; cough, bron spas, pulm irrit; derm; nau, vomit; loss of consciousness; [carc]	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 50 ppm: SA[*]/SCBA[*] 100 ppm: SA:CF[*]/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Ing Con	Eye irrit loc; nasal discharge; throat irrit, cough, dysp; nau, skin burns, derm	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, kidneys, liver, eyes

Formic acid

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Furfural C_4H_3OCHO 98-01-1 LT7000000 1199 29	2-Furaldehyde, Furfuraldehyde, Fural, 2-Furancarboxaldehyde	5 ppm (20 mg/m^3) (ACGIH) 2 ppm (8 mg/m^3)	250 ppm	Colorless to light-brown liquid, which darkens in light and air, with an odor like almonds	MW: 96 BP: 323°F Sol: 8.3% Fl.P: 140°F IP: 9.21 eV	VP: 2 mm MP: -34°F UEL: 19.3% LEL: 2.1%	Strong acids, oxidizers	NIOSH 79-141
Furfuryl alcohol $C_4H_3OCH_2OH$ 98-00-0 LU9100000 2874 55	2-Hydroxymethylfuran, 2-Furylmethanol	50 ppm (200 mg/m^3) (NIOSH) 50 ppm (200 mg/m^3) 10-hr TWA (ACGIH) 10 ppm	250 ppm	Amber liquid with a mildly irritating odor	MW: 98 BP: 338°F Sol: Miscible aq soln unstable Fl.P: 149°F	VP: < 1 mm MP: 6°F UEL: 16.3% LEL: 1.8%	Strong oxidizers, strong acids, organic acids may lead to polymerization	Ads; acetone; GC; Set 2
Glycidol $C_3H_6O_2$ 556-52-5 UB4375000	2-Hydroxymethyloxiran; Hydroxymethyl ethylene oxide; Epoxypropyl alcohol; 3-Hydroxypropylene oxide; 2,3-Epoxy-1-propanol	50 ppm (150 mg/m^3) (ACGIH) 25 ppm (75 mg/m^3)	500 ppm	Colorless liquid	MW: 74 BP: 331°F Sol: Miscible Fl.P: 162°F	VP(77°F): 0.9 mm MP: -49°F UEL: ? LEL: ?	Strong oxidizers, nitrates	Char; THF; GC; F
Graphite (natural) C 7782-42-5N VV7780000	Plumbego, Potelot, Corbo minerals, Black lead, Carburet of iron, Silver lead, Crayon noir	15 mppcf (ACGIH) 2.5 mg/m^3 (resp dust) 5 mg/m^3 (total dust)	N.A.	Black, greasy, odorless solid	MW: 12 BP: N.A. Sol: Insoluble	VP: ≅0 mm MP: 6040°F MEC: ?	Very strong oxidizers, such as fluorine, chlorine trifluoride, potassium peroxide	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 20 PPM: CCROV*/SA*/SCBA* 50 ppm: SA:CF*/PAPROV* 100 ppm: CCRFOV/GMFOV/SCBAF/SAF/ PAPRTOV*SAT:CF* 250 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, upper resp sys; head; derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	NIOSH 250 ppm: PAPROV*/ SCBA*/SA*/CCROV* Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Dizz; nau, diarr, vomit; resp depres; body temp depres	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 250 ppm: SA*/SCBA* 500 ppm: SA:CF*/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat, skin; narcosis	Eye: Irr immed Skin: Water wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys, CNS
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 75 mppcf: D 150 mppcf: DXSQ/SA/SCBA 375 mppcf: PAPRD/SA:CF 750 mppcf: HIEF/PAPRTHIE/SAF/SCBAF/SAT:CF 7500 mppcf: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh Con	Cough, dyspnea, black sputum, pulm func, fibrosis	Eye: Irr immed Breath: Fresh air	Resp Sys, CVS

Graphite (natural)

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Hafnium and compounds (as Hf) Hf 7440-58-6 MG4600000 1326 32 2545 40	Synonyms vary depending upon specific compounds	0.5 mg/m³	250 mg/m³	Appearance and odor vary depending upon specific compounds	Properties vary depending upon specific compounds		Strong oxidizers and chlorine	NIOSH 79-141
Heptachlor $C_{10}H_5Cl_7$ 76-44-8 PC0700000 2761 55	1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetra-hydro-4,7-methanoidene	0.5 mg/m³	100 mg/m³	Light tan, waxy solid with an odor like camphor	MW: 374 BP: Decomposes Sol: Insoluble Not combustible	VP: 0.0003 mm MP: 114 to 165°F May be dissolved in flammable liquid	Melted heptachlor with iron and rust	NIOSH 79-141
Heptane $CH_3(CH_2)_5CH_3$ 142-82-5 MI7700000 1206 27	Normal heptane, n-heptane	500 ppm (2000 mg/m³) (NIOSH) 85 ppm 10-hr TWA 440 ppm 15-min ceil (ACGIH) 400 ppm	4250 ppm	Colorless liquid with a mild, gasoline-like odor	MW: 100 BP: 209°F Sol: 0.005% Fl.P: 25°F IP: 9.90 eV	VP: 40 mm MP: -132°F UEL: 6.7% LEL: 1.1%	Strong oxidizers	Char; CS_2 GC; III
Hexachloroethane CCl_3CCl_3 67-72-1 KI4025000 9037 53	Perchloroethane	1 ppm (10 mg/m³) (NIOSH) lowest feasible limit (ACGIH) 10 ppm 100 mg/m³)	300 ppm Ca	Colorless solid with a camphor-like odor	MW: 237 BP: 372°F Sol: 0.005% Not combustible	VP: 0.22 mm MP: 372°F	Hot iron, zinc, aluminum, alkalies	Char; CS_2 GC;

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Promptly upon contam/daily Change: After work any poss contam Remove: Promptly contam non-imperv Provide: Eyewash, quick drench	OSHA 2.5 mg/m^3: DMXS 5 mg/m^3: DMXSQ/SA/SCBA 12.5 mg/m^3: PAPRDM/SA:CF^4 25 mg/m^3: HIEF/PAPRTHIE^4/SCBAF/SAF/SAT:CF 250 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh Ing Con	Irrit eyes, skin, muc memb	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, muc memb
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Quick drench	OSHA 5.0 mg/m^3: SA/SCBA 12.5 mg/m^3: SA:CF 25 mg/m^3: SAF/SCBAF/SAT:CF 100 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	In animals: tremors, convul, liver damage	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	In animals: CNS, liver
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 850 ppm: CCROV/SA/SCBA 1000 ppm: PAPRHOV/CCRFOV 2125 ppm: SA:CF 4250 ppm: GMFOV/SAF/SCBAF/SAT:CF Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Li-head, giddy, stupor; no appetite, nau; derm; chem pneumonia; unconsciousness	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, resp sys, PNS
Clothing: Repeat prolong Goggles: N.A. Wash: Promptly upon contam/daily Change: After work it may be contam Remove: Promptly contam non-imperv	NIOSH$^{\wedge}$ Ξ: SAF:PD,PP:ASCBA/SCBAF:PD,PP Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Hexachloronaphthalene $C_{10}H_2Cl_6$ 1335-87-1 QJ7350000	Halowax 1014	0.2 mg/m³	2 mg/m³	Light-yellow solid with an aromatic odor	MW: 335 BP: 650 to 730°F Sol: Insoluble Not combustible	VP: < 1 mm MP: 279°F	Strong oxidizers	Filter; hexane; GC; II
Hexane $CH_3(CH_2)_4CH_3$ 110-54-3 MN9275000 1208 27	Hexyl hydride, Normal hexane, n-hexane	500 ppm (1800 mg/m³) (NIOSH) 100 ppm 10-hr TWA 510 ppm 15-min ceil (ACGIH) 50 ppm	5000 ppm	Colorless liquid with a mild gasoline-like odor	MW: 86 BP: 156°F Sol: 0.014% Fl.P: -7°F IP: 10.18 eV	VP: 124 mm MP: -139°F UEL: 7.5% LEL: 1.1%	Strong oxidizers	Char; CS_2 GC; III
2-Hexanone $CH_3CO(CH_2)_3CH_3$ 591-78-6 MP1400000	Methyl butyl ketone, MBK, Butyl methyl ketone, Methyl n-butyl ketone	100 ppm (410 mg/m³) (NIOSH) 1 ppm (4 mg/m³) 10-hr TWA (ACGIH) 5 ppm	5000 ppm	Colorless liquid with a characteristic odor	MW: 100 BP: 262°F Sol: 1.4% Fl.P: 77°F	VP: 3 mm MP: -71°F UEL: 8% LEL: 1.2%	Strong oxidizers	Char; CS_2; GC; III
Hexone $CH_3COCH_2C_3H_7$ 108-10-1 SA9275000 1245 26	4-Methyl-2-pentanone, Methyl isobutyl ketone, Isobutyl methyl ketone, MIBK	100 ppm (410 mg/m³) (NIOSH) 50 ppm (200 mg/m³) 10-hr TWA (ACGIH) 50 ppm	3000 ppm	Colorless liquid with a pleasant odor	MW: 100 BP: 244°F Sol: 1.9% Fl.P: 73°F	VP: 15 mm MP: -119°F UEL: 7.5% LEL: 1.4%	Strong oxidizers	Char; CS_2; GC; III

		Health Hazards			
Personal Protection and Sanitation (See Table 2)	**Respirator Selection Upper Limit Devices Recommended (See Table 3)**	**Route**	**Symptoms (See Table 4)**	**First Aid (See Table 5)**	**Target Organs**
Clothing: AP molt/RP liq sol/prob fumes Goggles: AP poss molt/reas sol liq Wash: Promptly upon contam/daily Change: After may be contam solid Remove: Immed molt/promptly sol liq non-imperv	OSHA 2 mg/m^3: SA^a:SCBA^a Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing Con	Acneform derm, nau, confusion, jaundice, coma	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Liver, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly prob Change: N.A. Remove: Any wet immed (flamm)	NIOSH 1000 ppm: SA^a/SCBA^a 2500 ppm: SA:CF^a 5000 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Li-head; nau; head; numb, musc weak; irrit, eyes, nose; derm; chem pneumonia; giddiness	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys, lungs
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	NIOSH 10 ppm: SA/SCBA 25 ppm: SA:CF 50 ppm: SCBAF/SAF/SAT:CF 1000 ppm: SA:PD,PP^a 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose; peripheral neuropathy; weak, pares; derm; head; drow	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, skin, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 500 ppm: CCROV^a/SA^a/SCBA^a 1000 ppm: PAPRHOV^a/CCRFOV 1250 ppm: SA:CF^a 2500 ppm: GMFOV/SCBAF/SAF/SAT:CF 3000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb; head; narcosis, coma; derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin, CNS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
sec-Hexyl acetate $C_8H_{16}O_2$ 108-84-9 SA7525000 1233 26	1,3-Dimethylbutyl acetate; Methylamyl acetate; Methylisoamyl acetate; Methylisobutyl carbinol	50 ppm (300 mg/m³)	4000 ppm	Colorless liquid with a mild, pleasant fruity odor	MW: 144 BP: 285°F Sol: 0.13% Fl.P: 113°F	VP: 4 mm MP: -83°F UEL: ? LEL: 0.9% (at Fl.P)	Nitrates, strong oxidizers, alkalies, and acids	Char; CS_2; GC; III
Hydrazine N_2H_4 302-01-2 MU7175000 2029 28	Hydrazine, anhydrous	1 ppm (1.3 mg/m³) (NIOSH) 0.04 mg/m³ 120-min ceil See Appendix A (ACGIH) 0.1 ppm, A2	80 ppm Ca	Colorless liquid with a weak, ammonia-like odor; can be solid <36°F	MW: 32 BP: 236°F Sol: Miscible Fl.P: 100°F IP: 8.36 eV	VP: 10 mm MP: 36°F UEL: 100% LEL: 4.7%	Oxidizers, hydrogen peroxide, nitric acid; metal oxides, strong acids; porous materials	Bub (HCl) p-Dimethylaminobenzaldehyde, Color; III
Hydrogen bromide HBr 10035-10-6 MW3850000 1048 15	Anhydrous hydrobromic acid	3 ppm (10 mg/m³)	50 ppm	Colorless gas with an irritating, sharp odor; liquid under pressure	MW: 81 BP: -88°F Sol: 194% Not combustible IP: 11.62 eV	VP: >1 atm MP: -124°F	Strong oxidizers, strong caustics, metals, moisture	SiO_2; $NaHCO_3$; IC; III
Hydrogen chloride HCl 7647-01-0 MW4025000 1050 15	Anhydrous hydrogen chloride; Hydrochloric acid, anhydrous	5 ppm ceil (7 mg/m³)	100 ppm	Colorless gas with an irritating, pungent odor	MW: 37 BP: -121°F Sol: 62% Not combustible IP: 12.74 eV	VP: >1 atm MP: -173°F	Most metals, alkali or active metals	SiO_2; $NaHCO_3$; IC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	OSHA 500 ppm: CCROV^{a}/SA^{a}/SCBA^{a} 1000 ppm: PAPROV^{a}/CCRFOV 1250 ppm: SA:CF^{a} 2500 ppm: GMFOV/SCBAF/SAF 4000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Eye irrit, headache, narcosis	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	CNS, eyes
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat; temp blind; dizz; nau; derm; burns skin, eyes; [carc]	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, resp sys, skin, eyes
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 50 ppm: SA:CF^{v}/PAPRAG^{v} GMFAG/SAF/SCBAF Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFAG/SCBAE	Ing Con	Eye, nose, throat irrit; skin, eye burns	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: pH<3:AP/pH≥3:RP Goggles: Any poss Wash: pH<3:imm con/pH≥3: pro wet Change: N.A. Remove: Non-imp:pH<3:imm con/else pro wet Provide: pH<3:eyewash, quick drench	OSHA 50 ppm: SA^{a}/SCBA^{a}/CCRS^{a}/PAPRS^{a} 100 ppm: SA:CF^{a}/SAF/SCBAF Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFAG/SCBAE	Inh Ing Con	Inflamm nose, throat, lar; cough, burns throat, choking; burns eyes, skin; derm	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Hydrogen cyanide (as CN) HCN 74-90-8 MW6825000 1613 55	Hydrocyanic acid, Prussic acid, Formonitrile	5 mg/m³ (NIOSH) 5 mg/m³ 10-min ceil (4.7 ppm) (ACGIH) 10 ppm (10 mg/m³)	60 mg/m³	Colorless or pale blue liquid or gas with a bitter almond odor	MW: 27 BP: 79°F Sol: Miscible Fl.P: 0°F IP: 13.69 eV	VP: 620 mm MP: 3 to 7°F UEL: 40% LEL: 5.6%	Bases, such as caustics, amines	Filter/But (KOH); KOH; ISE; III
Hydrogen fluoride HF 7664-39-3 MW7875000 1052 15	Anhydrofluoric acid, HF-A	3 ppm (2 mg/m³) (NIOSH) 3 ppm (2.5 mg/m³) 10-hr TWA 6 ppm (5 mg/m³) 15-min ceil	20 ppm	Colorless, fuming liquid or gas with a strong, irritating odor	MW: 20 BP: 67°F Sol: Miscible Not combustible IP: 16.01 eV	VP: 760 mm MP: -118°F	Metals, concrete, glass, ceramics	SiO_2; $NaHCl_3$; IC; III
Hydrogen peroxide H_2O_2 7722-84-1 MX0900000 2015 47	High-strength hydrogen peroxide, Peroxide, Hydrogen dioxide	1 ppm (1.4 mg/m³)	75 ppm	Colorless liquid with a slightly sharp odor	MW: 34 BP: 286°F Sol: Miscible Not combustible, but powerful oxidizer IP: 11 eV	VP(86°F): 5 mm MP: 12°F	Oxidizable materials; iron, copper, brass, bronze, chromium, zinc, lead, manganese, silver, catalytic metals	—
Hydrogen selenide H_2Se 7783-07-5 MX1050000 2202 18	Selenium hydride	0.05 ppm (0.2 mg/m³)	2 ppm	Colorless gas with a very offensive odor	MW: 81 BP: -42°F Sol: 0.7% Fl.P: N.A. IP: 9.88 eV	VP: >1 atm MP: -87°F UEL: ? LEL: ?	Oxidizers, acids, water, halogenated hydrocarbons	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	NIOSH 40 ppm: SA/SCBA 50 ppm: SA:CF/GMFS/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape:GMFS/SCBAE	Inh Abs Ing Con	Asphyxia & death at high levels; weak; head; confusion; nau, vomit; increase rate & depth of respiration or resp slow & gasping	Eye: Irr immed Skin: Water flush immed Breath: Art resp/use Amyl Nitrite Pearls Swallow: Medical attention immed	CNS, CVS, liver, kidneys
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH 20 ppm: SA[‡]/SCBA[‡]/ PAPRS[‡]/CCRS[‡]/GMFS Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Eye, nose, throat irrit; pulm edema; skin, eye burns; nasal congestion; bron	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin
Clothing: Any poss Goggles: Any poss Wash: Promptly upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 10 ppm: SA[‡]/SCBA[‡] 25 ppm: SA:CF[‡] 50 ppm: SCBAF/SAF 75 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; corneal ulcer; erythema, vesicles on skin; bleaching hair	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 0.5 ppm: SA/SCBA 1.25 ppm: SA:CF[‡] 2 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS[§]/SCBAE	Inh Con	Irrit eyes, nose, throat; nau, vomit, diarr; metal taste, garlic breath; dizz; lass, ftg	Breath: Art resp	Resp sys, eyes

Hydrogen selenide

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Hydrogen sulfide H_2S 7783-06-4 MX1225000 1053 13	Sulfuretted hydrogen, Hydrosulfuric acid, Hepatic gas	20 ppm ceil 50 ppm 10-min peak (NIOSH) 10 ppm 10-min ceil (ACGIH) 10 ppm	300 ppm	Colorless gas with a strong odor of rotten eggs; liquid at high pressure, low temperature	MW: 34 BP: -76°F Sol: 2.9% Fl.P: N.A. IP: 10.43 eV	VP: 20 atm MP: -117°F UEL: 46% LEL: 4.3%	Strong oxidizers, metals	Imp ($CdOH_2$); Chem; spectro; A
Hydroquinone $C_6H_6O_2$ 123-31-9 MX3500000 2662 53	Quinol; 1,4-Dihydroxybenzene; 1,4-Benzenediol	2 mg/m³ (NIOSH) 2 mg/m³ 15-min ceil	200 mg/m³	Light tan, light gray, or colorless crystals	MW: 110 BP: 547°F Sol: 7% Fl.P: 329°F	VP: <0.001 mm MP: 338°F UEL: ? LEL: ?	Strong oxidizers	Filter; acids; HPLC III
Iodine I_2 7553-56-2 NN1575000	None	0.1 ppm ceil (1 mg/m³)	10 ppm	Violet solid with a sharp, characteristic odor	MW: 254 BP: 363°F Sol: 0.03% Not combustible IP: 9.37 eV	VP: 0.3 mm MP: 237°F	Gaseous or aqueous ammonia, acetylene, acetaldehyde, powdered aluminum, active metals	—
Iron oxide fume Fe_2O_3 1309-37-1 NO7400000 1376 37	Ferric oxide fume	10 mg/m³ (ACGIH) 5 mg/m³	N.A.	Red-brown fume with a metallic taste	MW: 160 BP: N.A. Sol: Insoluble Not combustible	VP: 0 mm MP: 2850°F	Calcium hypochloride	Filter; acid; AA; O

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Prevent skin freezing Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	NIOSH 100 ppm: SA^{4}/SCBA^{4} 250 ppm: SA:CF^{4} 300 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMF/SCBAE	Inh Ing Con	Apnea; coma, convuls; irrit eyes, conj pain, lac, photophobia, corn vesic; irrit resp sys; dizz; head; ftg; insom; GI	Eye: Irr immed Skin: Water flush immed Breath: Art resp	Resp sys, eyes
Clothing: Repeat prolong Goggles: Any poss > 7%/ Reas prob < 7% Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv Provide: Eyewash > 7%	NIOSH 50 mg/m^{3}: PAPRD* 100 mg/m^{3}: HiEF/SCBAF/ SAF/PAPRTHiE*SAT:CF 200 mg/m^{3}: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit eyes, conj kera; excitement; colored urine; nau; dizz; suffocation, rapid breathing; musc twitch, delirium; collapse	Eye: Irr immed (15 min) Skin: Water flush Breath: Fresh air Swallow: Medical attention immed	Eyes, resp sys, skin, CNS
Clothing: AP>7%/RP<7% Goggles: AP>7%/Reas<7% Wash: Imm contam >7%/pro <7% Change: N.A. Remove: Non-imperv imm contam >7%/pro wet <7% Provide: >7% eyewash, quick drench	OSHA 1 ppm: SA^{4}/SCBA^{4} 2.5 ppm: SA:CF^{4} 5 ppm: SAF/SCBAF 10 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOAG/SCBAE	Inh Ing Con	Irrit eyes, nose; lac; head; tight chest; skin burns, rash; cutaneous hypersensitivity; burn mouth; vomit; abdom pain; diarr	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin, CNS, CVS
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	ACGIH 50 mg/m^{3}: DMFu/SA/SCBA 125 mg/m^{3}: PAPRDMFu/SA:CF 250 mg/m^{3}: HiEF/PAPRTHiE/ SCBAF/SAF/SAT:CF 5000 mg/m^{3}: SA:PD,PP 7500 mg/m^{3}: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiE/SCBAE	Inh	Benign pneumoconiosis; X-ray shadows indistinguishable from fibrotic pneumoconiosis	Breath: Art resp	Resp sys

Iron oxide fume

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Isoamyl acetate $C_7H_{14}O_2$ 123-92-2 NS9800000	3-Methyl-1-butanol acetate, Banana oil, 2-Methylbutyl ethanoate	100 ppm (525 mg/m³)	3000 ppm	Clear, colorless liquid with a banana-like odor	MW: 130 BP: 294°F Sol: 0.2% Fl.P: 77°F	VP: 4 mm MP: -148°F UEL: 7.5% LEL(212°F): 1%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; III
Isoamyl alcohol $(CH_3)_2CHCH_2CH_2OH$ 123-51-3 EL5425000 1105 26	3-Methyl-1-butanol, Isobutylcarbinol, Isopentyl alcohol, Fermentation amyl alcohol, Fusel oil	100 ppm (360 mg/m³)	8000 ppm	Colorless liquid with an alcoholic odor which causes coughing	MW: 88 BP: 270°F Sol: 2.4% Fl.P: 109°F	VP: 2 mm MP: -179°F UEL(212°F): 9% LEL(212°F): 1.2%	Strong oxidizers	Char; 2-Propanol in CS_2; GC; III
Isobutyl acetate $CH_3COOCH_2CH(CH_3)_2$ 110-19-0 AI4025000 1213 26	2-Methylpropyl acetate, beta-Methylpropyl ethanoate, Acetic acid isobutyl ester	150 ppm (700 mg/m³)	7500 ppm	Clear, colorless liquid with a pleasant, fruity odor	MW: 116 BP: 243°F Sol: 0.67% Fl.P: 64°F IP: 9.97 eV	VP: 13 mm MP: 143°F UEL: 10.5% LEL: 2.4%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; III
Isobutyl alcohol $(CH_3)_2CHCH_2OH$ 78-83-1 NP9625000 1212 26	Isobutanol, IBA, 2-Methyl-1-propanol, Isopropylcarbinol	100 ppm (300 mg/m³) (ACGIH) 50 ppm (150 mg/m³)	8000 ppm	Colorless liquid with a mild, non-residual odor	MW: 74 BP: 226°F Sol: 8.7% Fl.P: 82°F IP: 10.09 eV	VP: 9 mm MP: -162°F UEL(212): 10.9% LEL(212): 1.2%	Strong oxidizers	Char; 2-Propanol in CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: CCROV/PAPROV/SA/SCBA 2500 ppm: SA:CF 3000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; narco; derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	OSHA 1000 ppm: CCRFOV/PAPROV* 2500 ppm: SA:CF* 5000 ppm: SCBAF/SAF/GMFOV 8000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; narcosis; head, dizz; dysp, nau, vomit, diarr; skin cracking	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV*/CCRFOV 3750 ppm: SA:CF* 7500 ppm: SCBAF/SAF/GMFOV Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Head; drow; irrit eyes, upper resp, skin; anes	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	ACGIH 500 ppm: SA$^{£}$/SCBA$^{£}$/CCROV$^{£}$ 1000 ppm: PAPROV/CCRFOV 1250 ppm: SA:CF$^{£}$ 2500 ppm: GMFOV/SCBAF/SAF 8000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, throat; head; drow; skin irrit, cracking	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Isophorone $C_9H_{14}O$ 78-59-1 GW7700000	3,5,5-Trimethyl-2-cyclohexene-1-one	25 ppm (140 mg/m^3) (NIOSH) 23 mg/m^3 10-hr TWA (5 ppm) (ACGIH) 5 ppm ceil	800 ppm	Colorless or pale liquid with a camphor-like odor	MW: 138 BP: 419°F Sol: 1.2% Fl.P: 184°F	VP: 0.2 mm MP: 17°F UEL: 3.8% LEL: 0.8%	Strong oxidizers	Char; CS_2; GC; III
Isopropyl acetate $CH_3COOCH(CH_3)_2$ 108-21-4 AI4930000 1220 26	Isopropyl ester of acetic acid, sec-Propyl acetate	250 ppm (950 mg/m^3)	16,000 ppm	Colorless liquid with a fruity odor	MW: 102 BP: 194°F Sol: 2.9% Fl.P: 40°F IP: 9.98 eV	VP: 43 mm MP: -92°F UEL: 8% LEL: 1.8%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; E
Isopropyl alcohol $CH_3CHOHCH_3$ 67-63-0 NT8050000 1219 26	Isopropanol, IPA, 2-Propanol, sec-Propyl alcohol	400 ppm (980 mg/m^3) (NIOSH) 400 ppm 10-hr TWA 800 ppm 15-min ceil	20,000 ppm	Colorless liquid with an odor of rubbing alcohol	MW: 60 BP: 180°F Sol: Miscible Fl.P: 53°F IP: 10.15 eV	VP: 33 mm MP: -128°F UEL: 12% LEL: 2%	Strong oxidizers	Char; 2-Butanol in CS_2; GC; III
Isopropylamine $(CH_3)_2CHNH_2$ 75-31-1 NT8400000 1221 68	Monoisopropylamine, 2-Aminopropane	5 ppm (12 mg/m^3)	4000 ppm	Colorless liquid with a pungent, ammonia-like odor	MW: 59 BP: 90°F Sol: Miscible Fl.P: -35°F IP: 8.72 eV	VP: 478 mm MP: -139°F UEL: 10.4% LEL: 2.0%	Strong acids and oxidizers	Bub; H_2SO_4; GC; K

		Health Hazards			
Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv Provide: Eyewash	NIOSH 40 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$/CCROV$^{\blacktriangle}$ 100 ppm: SA:CF$^{\blacktriangle}$/PAPROV$^{\blacktriangle}$ 200 ppm: GMFOV/SCBAF/SAF/ PAPRTOV$^{\blacktriangle}$/SAT:CF$^{\blacktriangle}$ 800 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; narco; derm; head; dizz	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 6250 ppm: SA:CF$^{\bullet}$ 12,500 ppm: SCBAF/SAF 16,000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose; narcosis; derm; skin irrit	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Repeat prolong Goggles: Repeat prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 1000 ppm: PAPROV$^{\bullet}$/CCRFOV 10,000 ppm: SA:CF$^{\bullet}$ 20,000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Mild irrit eyes, nose, throat; drow; dizz; head; dry cracking skin; GI cramps; nau, diarr	Eye: Irr immed Skin: Water flush Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Reason prob Goggles: Any poss Wash: Immed upon wet Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	OSHA 125 ppm: SA:CF$^{\bullet}$/PAPRS$^{\bullet}$ 250 ppm: CCRSF/GMFS/SCBAF/ SAF/PAPRTS$^{\bullet}$ 4000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat, skin; pulm edema; vis dist: skin, eye burns; derm	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Isopropyl ether $((CH_3)_2CH)_2O$ 108-20-3 TZ5425000 1159 26	Diisopropyl ether, 2-Isopropoxy propane	500 ppm (2100 mg/m³) (ACGIH) 250 ppm (1050 mg/m³)	10,000 ppm	Colorless liquid with a sharp, sweet, ether-like odor	MW: 102 BP: 156 °F Sol: 0.2% Fl.P: -18 °F IP: 9.20 eV	VP: 119 mm MP: -121 °F UEL: 7.9% LEL: 1.4%	Strong oxidizers	Char; CS_2; GC; V
Isopropyl glycidyl ether $C_6H_{12}O_2$ 4016-14-2 TZ3500000	Isopropoxymethyl-oxiran; 1,2-Epoxy-3-isopropoxy-propane; isopropyl epoxypropyl ether; IGE	50 ppm (240 mg/m³) (NIOSH) 50 ppm 15-min ceil	1500 ppm	Colorless liquid	MW: 116 BP: 270 °F Sol: 19% Fl.P: 92 °F	VP(77 °F): 9.4 mm MP: ? UEL: ? LEL: ?	Strong oxidizers and caustics	Char; CS_2; GC; F
Ketene CH_2CO 463-51-4 OA7700000	Carbomethene, Ethenone	0.5 ppm (0.9 mg/m³)	25 ppm	Colorless gas with a sharp odor	MW: 42 BP: -69 °F Sol: Reacts Fl.P: N.A. IP: 9.64 eV	VP: N.A. MP: -239 °F UEL: ? LEL: ?	Water, variety organic compounds	Bub (hydroxyl-ammonium chloride); $FeCl_3$; Color; G
Lead, inorganic fumes and dusts (as Pb) Pb 7439-92-1 OF7525000 2291 53	Synonyms vary depending upon specific compound	0.05 mg/m³ (Feb. 1979) (NIOSH) <0.1 mg/m³ 10-hr TWA (ACGIH) 0.15 mg/m³	Variable	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Strong oxidizers, hydrogen peroxide, active metals; sodium, potassium	Filter; HNO_3 AA or ICP; O

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed	ACGIH 1000 ppm: PAPROV[a]/CCROV[a] 2500 ppm: SA[a]/SCBA[a] 6250 ppm: SA:CF[a] 10,000 ppm: SAF/SCBAF/GMFOV Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose; resp discomfort; derm in animals: drowsy, dizz, unconsciousness	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	NIOSH 1250 ppm: SA:CF* 1500 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, upper resp, skin; skin sens	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 12.5 ppm: SA:CF* 25 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con	Irrit eyes, nose, throat, lungs; pulm edema	Breath: Art resp	Resp sys, eyes, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Daily Change: N.A. Remove: Promptly contam non-imperv	OSHA 0.5 mg/m^3: SA/HIE/SCBA 1.25 mg/m^3: PAPRHIE/SA:CF 2.5 mg/m^3: HiEF/PAPRTHIE/ SCBAF/SAF/SAT:CF 50 mg/m^3: SA:PD,PP 100 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh Ing Con	Lass; insom; pal, eye grounds; anor, low-wgt, malnut; consti, abdom pain, colic; hypotense; anemia; gingival lead line; trem, para wrist	Eye: Irr immed Skin: Soap flush promptly Breath: Art resp Swallow: Medical attention immed	GI tract, CNS, kidneys, blood, gingival tissue

Lead, inorganic fumes and dusts (as Pb)

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Lead arsenate $Pb_3(AsO_4)_2$ 3687-31-8 CG0990000 1617 53	Synonyms vary depending upon specific compound	0.05 mg/m³ (as lead) (NIOSH) 2 μg/m³ 15-min ceil (as arsenic) See Appendix A (ACGIH) 0.15 mg/m³	300 mg/m³ Ca	Odorless, colorless solid	Properties vary depending upon specific compounds		None hazardous	—
Lindane $C_6H_6Cl_6$ 58-89-9 GV4900000 2761 55	1,2,3,4,5,6-Hexachlorocyclohexane; gamma-Hexachlorocyclohexane; Benzene hexachloride	0.5 mg/m³	1000 mg/m³	Colorless solid with a musty odor (pure material is odorless)	MW: 291 BP: Decomposes Sol: 0.001% Not combustible	VP: 9.4×10^{6} mm MP: 234°F May be dissolved in combustible solvent	None hazardous	Filter/Bub iso-octane; GC; III
Lithium hydride LIH 7580-67-8 OJ6300000 1414 40	None	0.025 mg/m³	50 mg/m³	Off-white, translucent solid, odorless	MW: 8 BP: Decomposes Sol: Reacts Fl.P: N.A.	VP: 0 mm MP: 1267°F UEL: N.A. LEL: N.A.	Oxidizers, halogenated hydrocarbons, acids, water	—
LPG 68476-85-7 SE7545000 1075 22	Liquefied petroleum gas, Bottled gas	1000 ppm (1800 mg/m³)	19,000 ppm	Colorless, odorless gas (foul-smelling odorant added)	MW: 42 to 58 BP: -40 to 31°F Sol: Insoluble Fl.P: N.A. IP: 10.95 eV	VP: 2.1 to 8.6 atm MP: ? UEL: 9.5% LEL: 1.9%	Strong oxidizers	Compustible gas meter; G

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: N.A. Wash: Daily Change: After work any poss contam Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP Escape: HiEF/SCBAE	Inh Ing Con	Arsenic intox; nau, diarr; inflamm muc memb, skin; pig; lead intox; abdom pain, low-ap, consti; tired, weak, ner, neur; paresthesia; [carc]	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	GI tract, CNS, kidneys, blood, gingival tissue, lymphatics, skin
Clothing: Reason prob Goggles: N.A. Wash: Immed upon contam Change: After work it may be contam Remove: Immed contam liq non-imperv Provide: Quick drench	OSHA 5 mg/m³: CCROVDMFu/SA/SCBA 12.5 mg/m³: PAPROVDMFu[4]/SA:CF[4] 25 mg/m³: CCROVFHiE/SCBAF/SAF/GMFHiEOV/PAPRTOVHiE[4] 500 mg/m³: SA:PD,PP[4] 1000 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOVHiE/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat; head; nau; clonic convul; resp probs; cyan; aplastic anemia; skin irrit; musc spasms	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, CNS, blood, liver, kidneys, skin
Clothing: AP/RP air 0.1 > mg/m³ Goggles: Any poss Wash: Immed brush contam, wash Change: After work any poss contam Remove: Any contam immed Provide: Eyewash/> 0.5 mg/m³ quick drench	OSHA 0.25 mg/m³: SA/SCBA/HiE 0.625 mg/m³: SA:CF[4]/PAPRHiE[4] 1.25 mg/m³: HiEF/SCBAF/SAF/PAPRTHiE[4] 50 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Burns eyes, skin, mouth, esophagus; nau; musc twitches; mental confusion; blurring vision	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Prevent skin freezing Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	OSHA 10,000 ppm: SA/SCBA 19,000 ppm: SA:CF/SCBA/SAF/SAT:CF Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: SCBAE	Inh Con	Li-head, drowsy	Eye: Irr immed Skin: Water flush immed Breath: Art resp	Resp sys, CNS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Magnesium oxide fume MgO 1309-48-4 OM3850000 1418 40	Magnesia fume	15 mg/m³ (ACGIH) 10 mg/m³	N.A.	White fume	MW: 40 BP: 6480 °F Sol: Insoluble Not combustible	VP: ≅0 mm MP: 5072 °F	Chlorine trifluoride	Filter; HNO_3; AA; O
Malathion $C_{10}H_{19}O_6PS_2$ 121-75-5 WM8400000 2783 55	o,o-Dimethyl dithiophosphate of diethyl mercaptosuccinate; o,o-Dimethyl S-(1,2-dicarbethoxy-ethyl) phosphoro-dithiocite	15 mg/m³ (NIOSH) 15 mg/m³ 10-hr TWA (ACGIH, 10 mg/m³	5000 mg/m³	Colorless to brown liquid with a mild skunk-like odor	MW: 330 BP: Decomposes Sol: 0.0145% Not combustible	VP: 0.00004 mm MP: 37 °F	Strong oxidizers	Filter; iso-octane; GC; III
Maleic anhydride $(CHCO)_2O$ 108-31-6 ON3675000 2215 60	2,5-Furanedione; cis-Butenedioic anhydride; Toxilic anhydride	0.25 ppm (1 mg/m³)	N.A.	Colorless or white solid with a penetrating odor	MW: 98 BP: 396 °F Sol: Insoluble Fl.P: 215 °F	VP: 0.16 mm MP: 127 °F UEL: 7.1% LEL: 3.4%	Strong oxidizers; alkali metals, caustics, amines at > 150 °F	—
Manganese and compounds (as Mn) Mn 7439-96-5 OO9275000	Synonyms vary depending upon specific compound	5 mg/m³ ceil (ACGIH) 5 mg/m³ ceil (dust) 1 mg/m³ (fume)	10,000 mg/m³	Gray solid	MW: 55 BP: 3806 °F Sol: ? Fl.P: ?	VP(2240 °F): 1 mm MP: 2273 °F UEL: ? LEL: ?	Variable	Filter; HCl; AA; A

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	ACGIH 100 mg/m^3: DMFu/SA/SCBA 250 mg/m^3: SA:CF/PAPRDMFu 500 mg/m^3: HiEF/SCBAF/SAF/ PAPRTHiE$^{\triangle}$ 7500 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con	Irrit eyes, nose; flu-like fever; cough, chest pain (metal fume fvr)	Breath: Art resp	Resp sys, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	NIOSH 150 mg/m^3: SA/SCBA/CCROVDMFu 375 mg/m^3: SA:CF$^{\triangle}$/PAPROVDMFu$^{\triangle}$ 750 mg/m^3: SAF/SCBAF/CCRFOVHiE/ GMFHiEOV/PAPRTOVHiE$^{\triangle}$/SAT:CF$^{\triangle}$ 5000 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Miosis; eye, skin irrit; rhin; head; tight chest, wheez, lar spas; salv; anor, nau, vomit, abdom cramp, diarr; atax	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, liver, blood cholinesterase, CNS, CVS, GI
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv Provide: Eyewash	OSHA 6.25 ppm: SA:CF$^{\bullet}$ 12.5 ppm: SAF/SCBAF 500 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing Con	Conj; photophobia, double vision; nas, upper resp irrit; bron, asth; derm	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 50 mg/m^3: DM$^{\prime}$/SA/SCBA 125 mg/m^3: PAPRDM$^{\prime}$/SA:CF 250 mg/m^3: HiEF/PAPRTHiE/ SCBAF/SAF/SAT: CF 5000 mg/m^3: SA:PD,PP 7500 mg/m^3: SAF:PD,PP ΩSCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing	Parkinson's; asthenia, insom, mental; metal fume fvr; dry throat, cough, tight chest, dysp, rales; lo-back pain; vomit, mal; ftg	Breath: Art resp Swallow: Medical attention immed	Resp sys, CNS, blood, kidneys

Manganese and compounds (as Mn)

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Mercury and inorganic compounds (as Hg) Hg 7439-97-6 OV4550000 2024 53 2025 53 2809 60	Quicksilver	0.1 mg/m³ ceil (NIOSH) 0.05 mg/m³ 10-hr TWA (ACGIH) 0.05 mg/m³	28 mg/m³	Silvery, mobile odorless liquid	MW: 201 BP: 674°F Sol: 0.002% Not combustible	VP: 0.0012 mm MP: -38°F	Acetylenes, ammonia gases	Ads, thermal desorp; AA; III
Mercury, (organo) alkyl compounds (as Hg) 2003 40	Synonyms vary depending upon specific compound	0.01 mg/m³ 0.04 mg/m³ ceil	10 mg/m³	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Strong oxidizers, such as chlorine	NIOSH 77-157A
Mesityl oxide $CH_3COCH = C(CH_3)_2$ 141-79-7 SB4200000 1229 26	4-Methyl-3-penten-2-one, Isobutenyl methyl ketone, Methyl isobutenyl ketone, Isopropylidene acetone	25 ppm 100 mg/m³ (NIOSH) 10 ppm (40 mg/m³) 10-hr TWA (ACGIH) 15 ppm	5000 ppm	Clear, pale yellow, or colorless liquid with a strong peppermint odor	MW: 98 BP: 266°F Sol: 3% Fl.P: 87°F IP: 9.08 eV	VP: 8 mm MP: -51°F UEL: ? LEL: 1.4%	Oxidizers	Char; CH_3OH; GC III
Methoxychlor $C_{16}H_{15}Cl_3O_2$ 72-43-5 KJ3675000 2761 55	2,2-bis(p-Methoxyphenyl)-1,1,1-Trichloroethane	15 mg/m³ (ACGIH) 10 mg/m³	7500 mg/m³	Colorless to tan solid with a slight, fruity odor	MW: 346 BP: Decomposes Sol: 0.01% Fl.P: N.A.	VP: Very low MP: 172 to 187°F UEL: N.A. LEL: N.A.	Strong oxidizers	Filter; iso-octane; GC; Set 5

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: N.A. Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	See Appendix B	Inh Abs Con	Cough, dysp, bron pneu; tremor; insom; irrity, indecision; head; ftg, weak; stomatitis; salv; GI, anor, lo-wt; prot; irrit eyes, skin	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, resp sys, CNS, kidneys, eyes
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 0.1 mg/m^3: SA/SCBA 0.5 mg/m^3: SAF/SCBAF/SAT:CF 10 mg/m^3: SA:PD,PP 0.25 mg/m^3: SA:CF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Abs Ing Con	Pares, atax, dysart; vision, hearing; emotions; spastic, jerky; dizz; hypersalv; lac; nau, vomit, diarr, consti; derm	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, kidneys, eyes, skin
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Quick drench	NIOSH 250 ppm: SA:CF▾/PAPROV▾ 500 ppm: CCRFOV/GMFOV/SCBAF/SAF 5000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, muc memb; narco, coma	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys, CNS
Clothing: Repeat prolong Goggles: N.A. Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 100 mg/m^3: CCROVDMFu/SA/SCBA 250 mg/m^3: SA:CF/PAPROVDMFu 500 mg/m^3: CCRFOVHiE/SAF/ PAPRTOVHiE/SCBAF/GMFOVHiE/SAT:CF 7500 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing	None known in humans; in animals: trembling, convul; kidney, liver damage	Skin: Soap wash Breath: Fresh air Swallow: Medical attention immed	None known

Methoxychlor

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Methyl acetate CH_3COOCH_3 79-20-9 AI9100000 1231 26	Acetic acid, methyl ester; Methyl acetic ester; Methyl ethanoate	200 ppm (610 mg/m³)	10,000 ppm	Colorless liquid with a fruity odor	MW: 74 BP: 135°F Sol: 24.5% Fl.P: 14°F IP: 10.27 eV	VP: 173 MP: 144°F UEL: 16% LEL: 3.1%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; D
Methyl acetylene C_3H_4 74-99-7 UK4250000	Propyne, Allylene	1000 ppm (1650 mg/m³)	11,000 ppm based on LFL	Colorless gas with a sweet odor	MW: 40 BP: -10°F Sol: ≅Insoluble Fl.P: N.A. IP: 10.36 eV	VP: 3800 mm MP: -153°F UEL: 11.7% LEL: 1.7%	Strong oxidizers, chlorine, copper, copper alloys	Bag (none); GC; Set 6
Methyl acetylene-propadiene mixture UK4920000 1060 17	MAPP gas, Methyl acetylene-allene mixture, Propyne-allene mixture	1000 ppm (1800 mg/m³)	20,000 ppm	Colorless liquid with a strong, characteristic, foul odor	MW: 40 BP: -36 to -4°F Sol: Insoluble Fl.P: N.A.	VP: N.A. MP: ? UEL: 11% LEL: 3.4%	Strong oxidizers, copper alloys (>67% Cu)	NIOSH 80-125
Methyl acrylate $CH_2CHCOOCH_3$ 96-33-3 AT2800000 1919 27	Methyl propenoate	10 ppm (35 mg/m³)	1000 ppm	Clear, colorless liquid with a sharp, sweet, fruity odor	MW: 86 BP: 176°F Sol: 5.5% Fl.P: 13°F IP: 9.19 eV	VP: 68.2 mm MP: -130°F UEL: 25% LEL: 2.8%	Nitrates, oxidizers, peroxides, polymerizers, strong alkalies, moisture	Char; CS_2; GC; D

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: CCROV*/PAPROV*/ 2000 ppm: SA*/SCBA* 5000 ppm: SA:CF* 10,000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit nose, throat; head; drow; optic atrophy	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Prevent skin freezing Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	OSHA 10,000 ppm: SA/SCBA 11,000 ppm: SA:CF/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh	Drow, unconsciousness	Breath: Art resp	CNS
Clothing: Prevent skin freezing Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	OSHA 10,000 ppm: SA/SCBA 20,000 ppm: SA:CF/GMFS/ SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Con	Frostbite, disorientation, drowsy, unconsciousness	Eye: Irr immed Skin: Water flush immed Breath: Art resp	CNS, skin, eyes
Clothing: Any poss Goggles: Reason prob Wash: Immed upon wet Change: N.A. Remove: Any wet immed (flamm) Provide: Quick drench	OSHA 100 ppm: SA*/SCBA* 250 ppm: SA:CF* 500 ppm: SCBAF/SAF 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con	Irrit eyes, upper resp, skin	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin

Methyl acrylate

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Methylal $CH_3OCH_2OCH_3$ 109-87-5 PA8750000 1234 26	Dimethyoxymethane, Methyl formal, Formal, Dimethylacetal formaldehyde	1000 ppm (3100 mg/m³)	10,000 ppm	Colorless liquid with a pungent odor	MW: 76 BP: 111°F Sol: 33% Fl.P(oc): 0°F IP: 10.00 eV	VP: 330 mm MP: -157°F UEL: 17.6% LEL: 1.6%	Strong oxidizers, acids	Char; hexane; GC; F
Methyl alcohol CH_3OH 67-56-1 PC1400000 1230 28	Methanol, Wood alcohol, Columbian spirits, Carbinol	200 ppm (260 mg/m³) (NIOSH) 200 ppm 10-hr TWA 800 ppm 15-min ceil	25,000 ppm	Colorless liquid with a characteristic pungent odor	MW: 32 BP: 148°F Sol: Miscible Fl.P: 52°F IP: 10.84 eV	VP: 97 mm MP: -144°F UEL: 36% LEL: 6.7%	Strong oxidizers	SiO_2; water; GC; III
Methylamine CH_3NH_2 74-89-5 PF6300000 1061 19	Monomethylamine, Anhydrous methylamine	10 ppm (12 mg/m³)	100 ppm	Colorless gas with an ammonia-like odor, at low concentrations fishy odor, liquid under pressure	MW: 31 BP: 21°F Sol(77°F): 959 cc/100 ml Fl.P: N.A. IP: 8.97 eV	VP: N.A. MP: -136°F UEL: 21% LEL: 5%	Mercury, strong oxidizers	—
Methyl (n-amyl) ketone $CH_3COC_5H_{11}$ 110-43-0 MJ5075000 1110 26	n-Amyl methyl ketone, 2-Heptanone	100 ppm (465 mg/m³) (NIOSH) 100 ppm (465 mg/m³) 10-hr TWA (ACGIH) 50 ppm	4000 ppm	Clear, colorless liquid with a mild, banana oil-like odor	MW: 114 BP: 304°F Sol: 0.43% Fl.P(oc): 120°F IP: 9.33 eV	VP: 2 mm MP: -31°F UEL: 7.9% LEL: 1.1%	Strong acids, alkalies, oxidizers	Char; CH_3OH; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 10,000 ppm: SA/SCBA Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Mild irrit eyes, upper resp; anesthesia; irrit skin	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Skin, resp sys, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 2000 ppm: SA/SCBA 5000 ppm: SA:CF 10,000 ppm: SCBAF/SAF/SAT:CF 25,000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Ing Con	Eye irrit, head, drowsy, li-head, nau, vomit, vis dist, eye burns, digestive dist, failure of vision	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, CNS, GI tract
Clothing: Any poss (liq) Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	OSHA 100 ppm: SCBAF/SAF/ CCRSF/GMFS/PAPRS$^{\blacktriangle}$ Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Irrit eyes, resp sys; cough; burns; derm, conj	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any contam	NIOSH 1000 ppm: CCROV$^{\blacktriangle}$/SA$^{\blacktriangle}$/ SCBA$^{\blacktriangle}$/PAPROV$^{\blacktriangle}$ 2500 ppm: SA:CF$^{\blacktriangle}$ 4000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb; head; narcosis, coma; derm	Eye: Irr immed Skin: Soap wash Breath: Fresh air Swallow: Medical attention immed	Eyes, skin, resp sys, CNS, PNS

Methyl (n-amyl) ketone

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Methyl bromide CH_3Br 74-83-9 PA4900000 1062 55	Bromomethane	20 ppm (80 mg/m^3) (NIOSH) lowest feasible limit See Appendix A (ACGIH) 5 ppm	2000 ppm Ca	Colorless liquid or gas with a chloroform-like odor at high concentration	MW: 95 BP: 38°F Sol: < 0.1% Fl.P: None IP: 10.54 eV	VP: 1.8 atm MP: -137°F UEL: 14.5% LEL: 13.5%	Aluminum, strong oxidizers	Char; CS_2; GC; J
Methyl cellosolve $CH_3OCH_2CH_2OH$ 109-86-4 KL5775000 1188 26	2-Methoxyethanol, Glycol monomethyl ether, Ethylene glycol monomethyl ether, Methyl oxitol, Ektasolve, Jeffersol EM	25 ppm (80 mg/m^3) (NIOSH) lowest feasible limit (ACGIH) 5 ppm (16 mg/m^3)	2000 ppm	Colorless liquid with a mild, non-residual odor	MW: 76 BP: 256°F Sol: Miscible Fl.P: 107°F	VP: 6 mm MP: -121°F UEL: 19.8% LEL: 2.5%	Strong oxidizers and caustics	Char; CH_3OH/ CH_2Cl_2; GC; III
Methyl cellosolve acetate $C_5H_{10}O_3$ 110-49-6 KL5950000 1189 26	2-Methoxyethyl acetate, Glycol monomethyl ether acetate, Ethylene glycol monomethyl ether acetate	25 ppm (120 mg/m^3) (ACGIH) 5 ppm (24 mg/m^3)	4500 ppm	Colorless liquid with a mild, ether-like odor	MW: 118 BP: 293°F Sol: Miscible Fl.P: 111°F	VP: 2 mm MP: -85°F UEL: 8.2% LEL: 1.1%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; D
Methyl chloride CH_3Cl 74-87-3 PA6300000 1063 18	Chloromethane	100 ppm 200 ppm ceil 300 ppm 5 min/3-hr peak (NIOSH) Lowest feasible limit See Appendix A (ACGIH) 50 ppm	10,000 ppm Ca	Colorless gas with a faint, sweet odor which is not noticeable at dangerous concentrations	MW: 51 BP: -12°F Sol: Insoluble Fl.P: N.A. IP: 11.26 eV	VP: 4.8 atm MP: -144°F UEL: 19% LEL: 7.6%	Chemically active metals: potassium, powdered aluminum, zinc, magnesium	Char; CH_2Cl_2; GC; Set 2

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Reason prob Wash: Immed upon wet Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Head; vis dist; vertigo; nau, vomit, malaise; hand tremor; convuls; dysp; irrit eyes; skin irrit, vesiculation; [carc]	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, resp sys, skin, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Head, drowsy, weak, ataxia, tremor, som, anemic pallor, irrit eyes	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	CNS, blood, skin, eyes, kidneys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	ACGIH 50 ppm: SA[4]/SCBA[4] 125 ppm: SA:CF 250 ppm: SCBAF/SAF 4500 ppm: SA:PD,PP[4] Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Kidney damage, brain damage, eye irrit	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Kidneys, brain, CNS, PNS
Clothing: Prevent wet or freezing Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Con	Dizz, nau, vomit; vis dist; stagger; slur speech; convuls, coma; liver, kidney damage; frostbite; [carc]	Eye: Irr immed Skin: Water flush immed Breath: Art resp	CNS, liver, kidneys, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Methyl bromide CH_3Br 74-83-9 PA4900000 1062 55	Bromomethane	20 ppm (80 mg/m³) (NIOSH) lowest feasible limit See Appendix A (ACGIH) 5 ppm	2000 ppm Ca	Colorless liquid or gas with a chloroform-like odor at high concentration	MW: 95 BP: 38°F Sol: < 0.1% Fl.P: None IP: 10.54 eV	VP: 1.8 atm MP: -137°F UEL: 14.5% LEL: 13.5%	Aluminum, strong oxidizers	Char; CS_2; GC; J
Methyl cellosolve $CH_3OCH_2CH_2OH$ 109-86-4 KL5775000 1188 26	2 Methoxyethanol, Glycol monomethyl ether, Ethylene glycol monomethyl ether, Methyl oxitol, Ektasolve, Jeffersol EM	25 ppm (80 mg/m³) (NIOSH) lowest feasible limit (ACGIH) 5 ppm (16 mg/m³)	2000 ppm	Colorless liquid with a mild, non-residual odor	MW: 76 BP: 256°F Sol: Miscible Fl.P: 107°F	VP: 6 mm MP: -121°F UEL: 19.8% LEL: 2.5%	Strong oxidizers and caustics	Char; CH_3OH/CH_2Cl_2; GC; III
Methyl cellosolve acetate $C_5H_{10}O_3$ 110-49-6 KL5950000 1189 26	2-Methoxyethyl acetate, Glycol monomethyl ether acetate, Ethylene glycol monomethyl ether acetate	25 ppm (120 mg/m³) (ACGIH) 5 ppm (24 mg/m³)	4500 ppm	Colorless liquid with a mild, ether-like odor	MW: 118 BP: 293°F Sol: Miscible Fl.P: 111°F	VP: 2 mm MP: -85°F UEL: 8.2% LEL: 1.1%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; D
Methyl chloride CH_3Cl 74-87-3 PA6300000 1063 18	Chloromethane	100 ppm 200 ppm ceil 300 ppm 5 min/3-hr peak (NIOSH) Lowest feasible limit See Appendix A (ACGIH) 50 ppm	10,000 ppm Ca	Colorless gas with a faint, sweet odor which is not noticeable at dangerous concentrations	MW: 51 BP: -12°F Sol: Insoluble Fl.P: N.A. IP: 11.26 eV	VP: 4.8 atm MP: -144°F UEL: 19% LEL: 7.6%	Chemically active metals: potassium, powdered aluminum, zinc, magnesium	Char; CH_2Cl_2; GC; Set 2

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Reason prob Wash: Immed upon wet Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Head; vis dist; vertigo; nau, vomit, malaise; hand tremor; convuls; dysp; irrit eyes; skin irrit, vesiculation; [carc]	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, resp sys, skin, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Head, drowsy, weak, ataxia, tremor, som, anemic pallor, irrit eyes	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	CNS, blood, skin, eyes, kidneys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	ACGIH 50 ppm: SA*/SCBA* 125 ppm: SA:CF 250 ppm: SCBAF/SAF 4500 ppm: SA:PD,PP* Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Kidney damage, brain damage, eye irrit	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Kidneys, brain, CNS, PNS
Clothing: Prevent wet or freezing Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Con	Dizz, nau, vomit; vis dist; stagger; slur speech; convuls, coma; liver, kidney damage; frostbite, [carc]	Eye: Irr immed Skin: Water flush immed Breath: Art resp	CNS, liver, kidneys, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Methyl chloroform CH_3CCl_3 71-55-6 KJ2975000 2831 74	1,1,1-Trichloroethane; 1,1,1-Trichloroethane, stabilized	350 ppm (1900 mg/m³) (NIOSH) 350 ppm 15-min ceil	1000 ppm	Colorless liquid with a mild, chloroform-like odor	MW: 133 BP: 165 °F Sol: 0.07% Fl.P: None	VP: 100 mm MP: -36 °F UEL: 16% LEL: 7%	Strong caustics, strong oxidizers, chemically active metals, such as aluminum, magnesium powders, sodium, potassium	Char; CS; GC; III
Methyl chloromethyl ether—See Chloromethyl methyl ether								
Methylcyclohexane $CH_3C_6H_{11}$ 108-87-2 GV6125000 2296 27	Cyclohexylmethane, Hexahydrotoluene	500 ppm (2000 mg/m³) (ACGIH) 400 ppm (1600 mg/m³)	10,000 ppm	Colorless liquid with a faint, benzene-like odor	MW: 98 BP: 214 °F Sol: Insoluble Fl.P: 25 °F IP: 9.85 eV	VP: 37 mm MP: -196 °F UEL: 6.7% LEL: 1.2%	Strong oxidizers	Char; CS_2 GC; G
Methylcyclohexanol $CH_3C_6H_{10}OH$ 25639-42-3 GW0175000 2617 26	Hexahydrocresols; mixture of 2-,3-, and 4-Methylcylohexanols	100 ppm (470 mg/m³) (ACGIH) 50 ppm (235 mg/m³)	10,000 ppm	Straw-colored liquid with a weak, coconut oil odor	MW: 114 BP: 311 to 356 °F Sol: Slight Fl.P: 149 °F	VP: <1 mm MP: <6 °F UEL: ? LEL: ?	Strong oxidizers	Char; CH_2Cl_2; Set 5
o-Methylcyclohexanone $C_7H_{12}O$ 583-60-8 GW1750000 2297 26	2-Methylcyclohexanone	100 ppm (460 mg/m³) (ACGIH) 50 ppm (230 mg/m³)	2500 ppm	Colorless liquid with a weak peppermint odor	MW: 112 BP: 329 °F Sol: Insoluble Fl.P: 118 °F	VP: ≅1 mm MP: 6.8 °F UEL: ? LEL: ?	Strong oxidizers	Ads; Acetone; GC; Set 2

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	NIOSH 1000 ppm: SA*/SCBA* Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Head, lass, CNS depres, poor equi, irrit eyes, derm, card arrhy	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, CNS, CVS, eyes
Methyl chloromethyl ether—See Chloromethyl methyl ether					
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	ACGIH 4000 ppm: SA/SCBA 10,000 ppm: SA:CF/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Li-head; drowsy; skin, nose, throat irrit	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 500 ppm: SA*/SCBA* 1250 ppm: SA:CF* 2500 ppm: SCBAF:SAF 10,000 SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Head; irrit eyes, resp sys; derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes; in animals: CNS, liver, kidneys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 500 ppm: SA*/SCBA* 1250 ppm: SA:CF* 2500 ppm: SAF:SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	None known in humans; in animals: drow; irrit eyes, nose, throat, skin	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	In animals: pulmonary, lungs, liver, kidneys, skin

o-Methylcyclohexanone

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Methylene bisphenyl isocyanate $C_{15}H_{10}O_2N_2$ 101-68-8 NQ9350000 2489 53	MDI; 4,4-Diphenylmethane diisocyanate; Methylene bis(4-phenyl isocyanate); 4,4-Diisocyanodiphenylmethane	0.02 ppm ceil (0.2 mg/m³) (NIOSH) 50 µg/m³ 10-hr TWA (0.005 ppm) 200 µg/m³ 10-min ceil (0.02 ppm)	10 ppm	White to light-yellow flakes; odorless	MW: 250 BP: 342°F Sol: 0.2% Fl.P(oc): 396°F	VP: 0.05 mm MP: 99°F UEL: N.A. LEL: N.A.	Strong alkalies, acids, alcohol	Imp (reagent); acetic anhydride; HPLC; III
Methylene chloride CH_2Cl_2 75-09-2 PA8050000 1593 74	Dichloromethane, Methylene dichloride	500 ppm 1000 ppm ceil 2000 ppm 5 min/2-hr peak (NIOSH) 75 ppm 10-hr TWA 500 ppm 15-min ceil (ACGIH) 100 ppm	5000 ppm	Colorless liquid with a chloroform-like odor	MW: 85 BP: 104°F Sol: 1.3% Fl.P: None IP: 11.35 eV	VP: 350 mm MP: -142°F UEL: 19°F LEL: 12%	Strong oxidizers and caustics; chemically active metals, such as aluminum or magnesium powders; sodium, potassium	Char(2); CS_2; GC; III
Methyl formate $HCOOCH_3$ 107-31-3 LQ8925000 1243 26	Methyl methanoate, Formic acid, Methyl ester	100 ppm (250 mg/m³)	5000 ppm	Colorless liquid with a pleasant odor	MW: 60 BP: 89°F Sol: 30% Fl.P: -2°F IP: 10.81 eV	VP: 476 mm MP: -148°F UEL: 23% LEL: 5%	Strong oxidizers	Ads; Methyl/acetate; GC; Set 6
5-Methyl-3-heptanone $C_8H_{16}O$ 541-85-5 MJ7350000 2271 26	Ethyl sec-amyl ketone, Ethyl amyl ketone, Amyl ethyl ketone	25 ppm (130 mg/m³)	3000 ppm	Colorless liquid with a mild, fruity odor	MW: 128 BP: 318°F Sol: 0.26% Fl.P: 110°F	VP: 2 mm MP: -70°F UEL: ? LEL: ?	Oxidizers	Char; CH_3OH/CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Any poss Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	NIOSH 0.2 ppm: SA*/SCBA* 0.5 ppm: SA:CF* 1 ppm: SCBAF/SAF 10 ppm: SCBAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; cough, pulm secretions; chest pain, dysp, asthma	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	NIOSH 750 ppm: SA*/SCBA* 1875 ppm: SA:CF* 3750 ppm: SCBAF/SAF 5000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Ftg, weak, sleep, li-head; limbs numb, tingle; nau; irrit eyes, skin; vertigo; worsen angina	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, CVS, eyes, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: SA*/SCBA* 2500 ppm: SA:CF* 5000 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Eye, nose irrit; chest oppression, dysp; vis dist; CNS depres	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, CNS
Clothing: Any poss Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	OSHA 250 ppm: SA*/SCBA* 625 ppm: SA:CF*/PAPROV* 1000 ppm: CCRFOV 1250 ppm: GMFOV/SCBAF/SAF 3000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb; head; narco, coma; derm	Eye: Irr immed Skin: Water flush Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys, CNS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Methyl iodide CH_3I 74-88-4 PA9450000 2644 55	Iodomethane	5 ppm (28 mg/m³) (NIOSH) Lowest feasible limit See Appendix A (ACGIH) 2 ppm, A2	800 ppm Ca	Colorless liquid which turns yellow, red, or brown on exposure to light and moisture	MW: 142 BP: 106°F Sol: 2% Not combustible IP: 9.54 eV	VP: 375 mm MP: -87°F	Strong oxidizers	Char; toluene; GC; H
Methyl isobutyl carbinol $C_6H_{14}O$ 108-11-2 SA7350000 2053 26	Methyl amyl alcohol, 4-Methyl-2-pentanol, MIBC	25 ppm (100 mg/m³)	2000 ppm	Colorless liquid with a mild odor	MW: 102 BP: 269°F Sol: 1.5% Fl.P: 106°F	VP: 3.8 mm MP: -130°F UEL: 5.5% LEL: 1%	Strong oxidizers	Char; 2-Propanol in CS_2; GC; E
Methyl isocyanate CH_3NCO 624-83-9 NQ9450000 2480 30	None	0.02 ppm (0.05 mg/m³)	20 ppm	Colorless liquid with a sharp odor; causes tears	MW: 57 BP: 102°F Sol: 6.7% Fl.P(oc): < 0°F	VP: 348 mm MP: -112°F UEL: 26% LEL: 5.3%	Water, rapid reaction in presence of acid, alkali, amine; iron, tin, copper, their salts, other catalysts	Imp (reagent); acetic anhydride; HPLC; III
Methyl mercaptan CH_3SH 74-93-1 PB4375000 1064 13	Methanethiol	10 ppm 15-min ceil (20 mg/m³) (NIOSH) 0.5 ppm ceil 15-min ceil (ACGIH) 0.5 ppm	400 ppm	Colorless gas with a disagreeable odor like garlic; can be liquid at < 43°F	MW: 48 BP: 43°F Sol: 2.4% Fl.P(oc): 0°F IP: 9.44 eV	VP: > 1 atm MP: -186°F UEL: 21.8% LEL: 3.9%	Strong oxidizers, bleaches	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon wet Change: N.A. Remove: Immed contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Nau, vomit, vertigo, ataxia, slur speech, drow, derm, eye irrit, blister skin, [carc]	Eye: Irr immed Skin: Soap flush immed Breath: Art resp Swallow: Medical attention immed	CNS, skin, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 625 ppm: SA:CF£ 1250 ppm: SCBAF/SAF 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Eye irrit, head, drowsy, derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	OSHA 0.2 ppm: SA£/SCBA£ 0.5 ppm: SA:CF£ 1 ppm: SCBAF/SAF 20 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; cough, secretions, chest pain, dysp; asth; eye, skin injury	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: Prevent freezing Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	NIOSH 5 ppm: SA/SCBA/CCROV 12.5 ppm: SA:CF/PAPROV 25 ppm: SCBAF/SAF/CCRFOV/GMFOV/ PAPRTOV/SAT:CF 400 ppm: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con	Narco, cyan, convuls, pulm irrit, resp paralysis, head, nau	Eye: Irr immed Skin: Water flush immed Breath: Art resp	Resp sys, CNS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Methyl methacrylate $CH_2C(CH_3)COOCH_3$ 80-62-6 OZ5075000 1247 27	Methacrylic acid, methyl ester	100 ppm (410 mg/m³)	4000 ppm	Colorless liquid with an acrid, fruity odor	MW: 100 BP: 212°F Sol: 1.5% Fl.P(oc): 50°F	VP: 35 mm MP: -54°F UEL: 8.2% LEL: 1.7%	Nitrates, oxidizers, peroxides, polymerizers, strong alkalies, moisture	Char; CS_2; GC; D
alpha-Methyl styrene $C_6H_5C(CH_3)CH_2$ 98-83-9 WL5250000	1-Methyl-1-phenylethylene, AMS	100 ppm ceil (480 mg/m³) (ACGIH) 50 ppm (240 mg/m³)	5000 ppm	Colorless liquid with a characteristic odor	MW: 118 BP: 329°F Sol: Insoluble Fl.P: 129°F IP: 8.35 eV	VP: 1.9 mm MP: -9°F UEL: 6.1% LEL: 1.9%	Oxidizers, peroxides, halogens, catalysts for vinyl or ionic polymers; aluminum, iron chloride	Char; CS_2; GC; III
Mica (less than 1% quartz) 12001-26-2 VV8760000	Varies depending upon specific hydrous silicate	20 mppcf	N.A.	Colorless, odorless flakes or sheets with < 1% quartz	MW: 797 BP: N.A. Sol: Insoluble Not combustible	VP: ≈0 mm MP: N.A.	None	—
Molybdenum, soluble compounds (as Mo) Mo 7439-93-7 QA4680000	Synonyms vary depending upon specific compound	5 mg/m³	N.A.	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Alkali metals; sodium, potassium, molten magnesium	Filter; water; AA; M

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV▼/CCRFOV 2500 ppm: SA:CF▼ 4000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; derm, narco	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, upper resp sys, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 500 ppm: CCROV▲/SA▲/SCBA▲ 1000 ppm: PAPROV▲/CCRFOV 1250 ppm: SA:CF▲ 2500 ppm: GMFOV/SCBAF/SAF 5000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; drow; derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 100 mppcf: DM 200 mppcf: DXSQ/SA/SCBA 500 mppcf: PAPRDM/SA:CF 1000 mppcf: HiEF/PAPRTHiE/SCBAF/ SAF/SAT:CF 10,000 mppcf: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh	Pneumoconiosis by X-ray, cough, dysp, weak, weight loss	Eye: Irr immed Breath: Fresh air	Lungs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	OSHA 50 mg/m^3: DXSQ▲/SA▲/SCBA▲ 125 mg/m^3: PAPRDM▲/SA:CF▲ 250 mg/m^3: HiEF/PAPRTHiE▲/ SAT:CF▲/SCBAF/SAF 5000 mg/m^3: SA:PD,PP▲ 7500 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	In animals: loss of appetite, inco; irrit eyes, nose, throat; dysp, anemia; colic; gout	Eye: Irr immed Skin: Water flush Breath: Art resp Swallow: Medical attention immed	Resp sys; in animals: kidneys, blood

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Molybdenum, insoluble compounds (as Mo) Mo 7439-93-7 QA4680000	Synonyms vary depending upon specific compound	15 mg/m³ (ACGIH) 10 mg/m³	N.A.	Appearance and odor vary depending upon specific compound	Properties depending upon specific compound		Strong oxidizers	Filter; acid; AA; O
Monomethyl aniline $C_6H_5NHCH_3$ 100-61-8 BY4550000 2294 57	N-Methyl aniline, MA, Methyl aniline	2 ppm (9 mg/m³) (ACGIH) 0.5 ppm (2 mg/m³)	100 ppm	Yellow to light-brown liquid with a weak, ammonia-like odor	MW: 107 BP: 384°F Sol: Moderate Fl.P: 175°F IP: 7.34 eV	VP: < 1 mm MP: -112°F UEL: ? LEL: ?	Strong acids, strong oxidizers	Bub (H_2SO_4); NaOH; GC; K
Monomethyl hydrazine CH_3NHNH_2 60-34-4 MV5600000 1244 28	Methyl hydrazine	0.2 ppm ceil (0.35 mg/m³) (NIOSH) 0.08 mg/m³ 120-min ceil See Appendix A	5 ppm Ca	Fuming, colorless liquid with an ammonia-like odor	MW: 46 BP: 190°F Sol: Soluble Fl.P: 17°F IP: 7.67 eV	VP: 36 mm MP: -62°F UEL: 98% LEL: 2.5%	Oxides of iron, copper; manganese, lead, copper alloys; porous metals, earth, asbestos, wood, cloth; oxidants, hydrogen peroxide, nitric acid	Bub (HCl) Phosphomolybdic acid; color; K
Morpholine C_4H_9ON 110-91-8 QD6475000 2054 29	Tetrahydro-1,4-oxazine; Diethylenimide oxide	20 ppm (70 mg/m³)	8000 ppm	Colorless liquid with a weak, ammonia-like odor	MW: 67 BP: 263°F Sol: Miscible Fl.P: 95°F	VP: 7 mm MP: 23°F UEL: 11% LEL: 1.8%	Strong acids, strong oxidizers	SiO_2; H_2SO_4; GC; K

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	ACGIH 50 mg/m^3: DM$^{\prime}$ 100 mg/m^3: DMXSQ$^{\prime}$/SA/SCBA 250 mg/m^3: PAPRDM$^{\prime}$/SA:CF/ 500 mg/m^3: HIEF/PAPRTHIE/ SAT:CF/SCBAF/SAF 7500 mg/m^3:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh Ing	In animals: irrit eyes, nose, throat; weight loss	Breath: Art resp Swallow: Medical attention immed	None known
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv	ACGIH 5 ppm: SA/SCBA 12.5 ppm: SA:CF 25 ppm: SCBAF/SAF/SAT:CF 100 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Weak, dizz; head; dyps, cyan; methemoglobinemia; pulm edema; liver, kidney damage	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, liver, kidney, blood
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Abs Ing Con	Irrit eyes, vomit, diarr, resp irrit, tremors, ataxia, anoxia, cyan, convuls, [carc]	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, resp sys, liver, blood, CVS, eyes
Clothing: >25% AP/≤ 25% RP Goggles: Any poss Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: >15% eyewash/ >25% drench	OSHA 500 ppm: SA:CF*/PAPROV* 1000 ppm: SCBAF/SAF/CCRFOV 8000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Vis dist; nose irrit; cough; resp irrit; eye, skin irrit	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Naphtha (coal tar) 65996-79-4 GF8635000 2553 27	Naphtha, Crude solvent coal tar naphtha, High solvent naphtha	100 ppm (400 mg/m³)	10,000 ppm	Reddish-brown mobile liquid with an aromatic odor	MW: ≈110 BP: 230 to 374 °F Sol: Insoluble Fl.P: 100 to 109 °F	VP: < 5 mm MP: ? UEL: ? LEL: ?	Strong oxidizers	Char; CS_2; GC; G
Naphthalene $C_{10}H_8$ 91-20-3 QJ0525000 1334 32	White tar, Naphthalin	10 ppm (50 mg/m³)	500 ppm	Colorless to brown solid with an odor of mothballs	MW: 128 BP: 424 °F Sol: 0.003% Fl.P: 174 °F IP: 8.14 eV	VP: 0.05 mm MP: 165 to 176 °F UEL: 5.9% LEL: 0.9%	Strong oxidizers	Char; CS_2; GC, III
alpha-Naphthylamine $C_{10}H_9N$ 134-32-7 QM1400000 800185 2077 55	1-Naphthylamine, 1-Amino-naphthalene	See Appendix C (NIOSH)	Ca	Colorless crystals with an unpleasant odor, which darken in air to a purplish-reddish color	MW: 143 BP: 572 °F Sol: .04% Fl.P: 315 °F	VP: 1 mm at 104 °C MP: 122 °F UEL: ? LEL: ?	Not available	NIOSH 77-157A
beta-Naphthylamine $C_{10}H_9N$ 91-59-8 QM2100000 1650 55	2-Naphthylamine; 2-Amino-naphthalene	See Appendix C (NIOSH) (ACGIH) A1b	Ca	Odorless, white to reddish, leaflet-shaped crystals which darken in air to reddish-purple color	MW: 143 BP: 583 °F Sol: Insoluble Fl.P: Combustible solid	VP: 1 mm at 108 °C MP: 230 °F UEL: ? LEL: ?	Not available	NIOSH 77-157A

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	OSHA 1000 ppm: PAPROV$^{¥}$/CCRFOV 2500 ppm: SA:CF$^{¥}$ 5000 ppm: GMFOV/SCBAF/SAF 10,000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Li-head, drowsy; irrit eyes, nose, skin; derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 100 ppm: CCROVDM$^{£}$/SA$^{£}$/SCBA$^{£}$ 250 ppm: SA:CF$^{£}$/PAPROVDM$^{£}$ 500 ppm: CCROVFHiE/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Eye irrit; head; conf, excitement; mal, nau, vomit, abdom pain; irrit bladder; profuse sweat; jaun; hema; hemog, renal shut; derm	Eye: Irr immed Skin: Molten: flush immed sol/liq: soap wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, blood, liver, kidneys, skin, RBC, CNS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBA	Inh Abs Ing Con	Derm; hemorragic cystitis, dysp, ataxia, methemoglobinemia; hema; dys; [carc]	Eye: Irr immed (15 min) Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Bladder, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBA	Inh Abs Ing Con	Derm, hemorragic cystitis, dysp, ataxia, methemoglobinemia, hema, dys, [carc]	Eye: Irr immed (15 min) Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Bladder, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Nickel, metal and soluble compounds (as Ni) Ni 7440-02-0 QR5950000 1378 32	Synonyms vary depending upon specific compound	1 mg/m³ (NIOSH) 15 µg Ni/m³ 10-hr TWA See Appendix A (ACGIH) 1 mg/m³ (metal) 0.1 mg/m³ (soluble)	Ca	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Strong acids, sulfur, $Ni(NO_3)_2$; wood, other combustibles	Filter; acid; AA; N
Nickel carbonyl $Ni(CO)_4$ 13463-39-3 QR6300000 1259 28	None	0.001 ppm (0.007 mg/m³) (NIOSH) 1 ppb TWA (lowest detectable limit) See Appendix A (ACGIH) 0.05 ppm	0.001 ppm Ca	Colorless liquid with a musty odor	MW: 171 BP: 109°F Sol: 0.018% Fl.P: < -4°F IP: 8.28 eV	VP: 321 mm MP: -13°F UEL: ? LEL: 2%	Nitric acid, chlorine, other oxidizers, combustible vapors	NIOSH 82-100
Nicotine $C_{10}H_{14}N_2$ 54-11-5 QS5250000 1654 55	3-(1-Methyl-2-pyrrolidyl) pyridine	0.5 mg/m³	35 mg/m³	Pale yellow to dark brown liquid with a slight, fishy odor when warm	MW: 162 BP: 511°F Sol: Miscible < 140°F Fl.P: 203°F	VP: 0.0425 mm MP: -110°F UEL: 4% LEL: 0.7%	Strong oxidizers, strong acids	Resin; ethyl acetate; GC; T
Nitric acid HNO_3 7697-37-2 QU5775000 2032 44	Aqua fortis, White fuming nitric acid (WFNA), Red fuming nitric acid (RFNA), Hydrogen nitrate	2 ppm (5 mg/m³) (NIOSH) 2 ppm (5 mg/m³) 10-hr TWA	100 ppm	Colorless, yellow, or red fuming liquid with an acrid, suffocating odor	MW: 63 BP: 183 to 251°F Sol: Miscible Not combustible IP: 11.03 eV	VP: 2.6 to 103 mm MP: -42 to -61°F	Combustible organics, oxidizable matter; wood, turpentine, metal powder, hydrogen sulfide, etc.; strong bases	SiO_2; $NaHCO_3$; IC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: N.A. Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	Niosh Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Sens derm; allergic asth; nasal cavities; pneumonitis; [carc]	Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Nasal cavities, lungs, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	Head; verti, nau, epigastric pain, substernal pain; cough, hyperpnea; cyan; leukocytosis, pneuitis, paranasal sinus; delirium; convul; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Lungs, paranasal sinus, CNS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 5 mg/m^3: SA/SCBA 12.5 mg/m^3: SA:CF$^{£}$ 25 mg/m^3: SCBAF/SAF/SAT:CF$^{£}$ 35 mg/m^3: SA:PD,PP$^{£}$ Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Nau, salv, abdom pain, vomit, diarr, head, dizz, disturb hearing, vision, confusion, weak, inco, paroxysma/atrial fibrl, convul, dyps	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, CVS, lungs, GI tract
Clothing: AP pH< 2.5/RP pH >2.5 Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: pH <2.5 eyewash, quick drench	NIOSH 125 mg/m^3: SA:CF$^{£}$ 250 mg/m^3: SCBAF/SAF/GMFS$^{¥}$/CCRFS$^{¥}$ Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFVS$^{¥}$/SCBAE	Inh Ing Con	Irrit eyes, muc memb, skin; delayed pulm edema; pneuitis; bron; dental erosion	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin, teeth

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Nitric oxide NO 10102-43-9 QX0525000 1660 20	Nitrogen monoxide	25 ppm (30 mg/m³) (NIOSH) 25 ppm 10-hr TWA (30 mg/m³)	100 ppm	Colorless gas with a sharp, sweet odor, brown at high concentrations in air	MW: 30 BP: -241°F Sol: Reacts Not combustible IP: 9.27 eV	VP: 26,000 mm MP: -263°F	Combustible matter, chlorinated hydrocarbons, ammonia, carbon disulfide, metals, fluorine, ozone	Ads; reagent color; color; Set 5
p-Nitroaniline $C_6H_6N_2O_2$ 100-01-6 BY7000000 1661 55	Azoic diazo component 37, para-Aminonitrobenzene, Fast red GG base, 4-Nitroaniline, PNA	1 ppm (6 mg/m³) (ACGIH) 3 mg/m³	300 mg/m³	Yellow crystals with a pungent, faint ammonia-like odor	MW: 138 BP: 630°F Sol: 0.08% Fl.P: 390°F IP: 8.85 eV	VP: <<1 mm MP: 293°F UEL: ? LEL: ?	Strong oxidizers and reducers	NIOSH 79-141
Nitrobenzene $C_6H_5NO_2$ 98-95-3 DA6475000 1662 55	Nitrobenzol, Oil of mirbane	1 ppm (5 mg/m³)	200 ppm	Pale yellow to dark brown, oily liquid with an odor like black paste shoe polish	MW: 123 BP: 412°F Sol: 0.2% Fl.P: 190°F IP: 9.92 eV	VP: <<1 mm MP: 41°F UEL: ? LEL: 1.8%	Concentrated nitric acid, nitrogen tetroxide, caustic, chemically active metals like tin or zinc	SiO_2; CH_3OH; GC; P
4-Nitrobiphenyl $C_{12}H_9NO_2$ 92-93-3 DV5600000	p-Nitrobiphenyl, p-Nitrodiphenyl, 4-Nitrodiphenyl, 4-Phenyl-nitrobenzene, p-Phenyl-nitrobenzene, PNB	See Appendix C (NIOSH) (ACGIH) A1b	Ca	White to yellow needle-like crystals	MW: 199 BP: 644°F Sol: Insoluble Fl.P: N.A.	VP: ? MP: 237°F UEL: N.A. LEL: N.A.	Strong reducers	NIOSH 77-157A

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	NIOSH 100 ppm: SA:CF$^{£}$/ PAPRS$^{¥£}$/SA$^{£}$/SCBA$^{£}$/ CCRSF$^{¥}$/GMFS$^{¥}$ Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS$^{¥}$/SCBAE	Inh Con	Irrit eyes, nose, throat; drows; unconscious	Breath: Art resp	Resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Immed upon contam/daily Change: After work it may be contam Remove: Immed contam non-imperv Provide: Quick drench	ACGIH 30 mg/m^{3}: SA$^{£}$/SCBA$^{£}$ 75 mg/m^{3}: SA:CF$^{£}$ 150 mg/m^{3}: SCBAF/SAF 300 mg/m^{3}: SA:PD,PP$^{£}$ Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOVDMFu/SCBAE	Inh Abs Ing Con	Cyan, ataxia, tachycard, tachypnea, dysp, irrity, vomit, diarr, convuls, resp arrest, anemia, methemoglobinemia	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Blood, heart, lungs, liver
Clothing: Any poss Goggles: Reason prob Wash: N.A. Change: After work any poss contam Remove: Immed contam non-imperv Provide: Quick drench	OSHA 10 ppm: CCROV$^{£}$/SA$^{£}$/ SCBA$^{£}$ 25 ppm: SA:CF$^{£}$/PAPROV$^{£}$ 50 ppm: CCRFOV/GMFOV/SCBAF/SAF 200 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Anoxia, irrit eyes, derm, anemia, dizz, nau, vomit, dysp	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Blood, liver, kidneys, CVS, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Head, lethargy, dizz, dysp, ataxia, weak, methemoglobinemia, urinary burning, acute hemorrhage cystitis, [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Bladder, blood

4-Nitrobiphenyl

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
p-Nitrochlorobenzene $ClC_6H_4NO_2$ 100-00-5 CZ1050000 1578 55	PNCB, PCNB, 4-Chloronitrobenzene, p-Chloronitrobenzene, 1-Chloro-4-nitrobenzene	1 mg/m³	1000 ppm	Yellow solid with a sweet odor	MW: 158 BP: 468°F Sol: 0.003% Fl.P: 261°F IP: 9.99 eV	VP: <<1 mm MP: 181°F UEL: ? LEL: ?	Strong oxidizers	SiO_2; CH_3OH; GC; P
Nitroethane $C_2H_5NO_2$ 79-24-3 KI5600000 2842 26	None	100 ppm (310 mg/m³)	1000 ppm	Colorless liquid with a mild, fruity odor	MW: 75 BP: 237°F Sol: 4.5% Fl.P: 82°F IP: 10.88 eV	VP: 15.6 mm MP: -130°F UEL: ? LEL: 3.4%	Amines, strong acids, alkalies, and oxidizers; hydrocarbons, other combustibles; metal oxides	NIOSH 80-125
Nitrogen dioxide NO_2 and N_2O_4 10102-44-0 QW9800000 1067 20	Nitrogen tetroxide, NTO, Dinitrogen tetroxide, Nitrogen peroxide	5 ppm ceil (9 mg/m³) (NIOSH) 1 ppm 15-min ceil (1.8 mg/m³) (ACGIH) 3 ppm	50 ppm	Dark brown, fuming liquid or gas with a pungent, acrid odor	MW: 46/92 BP: 70°F Sol: Reacts Not combustible IP: 9.75 eV	VP: 720 mm MP: 12°F	Combustible matter, chlorinated hydrocarbons, ammonia, carbon disulfide	Ads; Sulfanilimide & NEDA color; III
Nitrogen trifluoride NF_3 7783-54-2 QX1925000 2451 15	None	10 ppm (29 mg/m³) (ACGIH) 10 ppm (30 mg/m³)	2000 ppm	Colorless gas with a moldy odor	MW: 71 BP: -200°F Sol: Insoluble Not combustible IP: 13 eV	VP: >1 atm MP: -340°F	Water, oil, grease; oxidizable materials; ammonia, carbon monoxide, methane, hydrogen, hydrogen sulfide, active metals; oxides	—

		Health Hazards			
Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Reason prob Wash: Pro contam/immed wet/daily Change: After work it may be contam Remove: Pro contam/immed wet non-imperv Provide: Quick drench	OSHA 10 mg/m^3: DMXSQ/SA/SCBA 25 mg/m^3: PAPRDM/SA:CF 50 mg/m^3:HiEF/PAPRTHiE/ SAT:CF/SCBAF SAF 1000 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Anoxia, unpleasant taste; mild anemia; dizz, weak; nau, vomit; dysp	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Blood, liver, kidneys, CVS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Con Ing	Derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH 25 ppm: SA:CF$^{£}$ 50 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS$^{¥}$/SCBAE	Inh Ing Con	Cough, mucoid frothy sputum, dysp, chest pain, pulm edema, cyan, tachypnea, tachycardia, eye irrit	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CVS
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 100 ppm: SA/SCBA/CCRS 250 ppm: SA:CF/PAPRS 500 ppm: SCBAF/SAF/CCRSF/ GMFS/SAT:CF$^{£}$/PAPRTS$^{£}$ 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh	None known in humans; in animals: methemoglobinemia	Breath: Art resp	None known in humans; in animals: blood

Nitrogen trifluoride

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Nitromethane CH_3NO_2 75-52-5 PA9800000 1261 26	None	100 ppm (250 mg/m³)	1000 ppm	Colorless liquid with a mild, fruity odor	MW: 61 BP: 214°F Sol: 9.5% Fl.P: 95°F IP: 11.08 eV	VP: 27.8 mm MP: -20°F UEL: ? LEL: 7.3%	Amines, strong acids, alkalies, and oxidizers; hydrocarbons, other combustibles; metallic oxides	NIOSH 78-175
1-Nitropropane $CH_3CH_2CH_2NO_2$ 108-03-2 TZ5075000 2608 26	None	25 ppm (90 mg/m³)	2300 ppm	Colorless liquid with a mild, fruity odor	MW: 89 BP: 268°F Sol: 1.4% Fl.P: 96°F IP: 10.81 eV	VP: 7.5 mm MP: -162°F UEL: ? LEL: 2.2%	Amines, strong acids, alkalies; strong oxidizers; hydrocarbons, other combustibles, metal oxides	—
2-Nitropropane $CH_3CH(NO_2)CH_3$ 79-46-9 TZ5250000 2608 26	sec-Nitropropane	25 ppm (90 mg/m³) (NIOSH) Lowest feasible limit See Appendix A (ACGIH) 10 ppm, A2	2300 ppm Ca	Colorless liquid with a mild, fruity odor	MW: 89 BP: 248°F Sol: 1.7% Fl.P: 82°F IP: 10.71 eV	VP: 12.9 mm MP: -135°F UEL: ? LEL: 2.6%	Amines, strong acids, alkalies, and oxidizers, metal oxides, combustible materials	—
N-Nitrosodimethylamine $C_2H_6N_2O$ 62-75-9 IQ0525000	N-Nitrosodimethylamine; NDMA; Dimethylnitrosamine; DMNA; N,N-Dimethylnitrosamine; DMN; N-Methyl-N-Nitrosomethanamine	See Appendix C (NIOSH) (ACGIH) A2	Ca	Yellow liquid of low viscosity, no appreciable odor	MW: 74 BP: 306°F Sol: Soluble Fl.P: N.A.	VP: ? MP: ? UEL: N.A. LEL: N.A.	Strong oxidizing agents	NIOSH 77-157A

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: SA:CF$^{\bullet}$/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Con Ing	Derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin
Clothing: N.A. Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	OSHA 250 ppm: SA*/SCBA* 625 ppm: SA:CF* 1250 ppm: SCBAF/SAF 2300 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Con Ing	Eye irrit, head, nau, vomit, diarr	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, CNS
Clothing: N.A. Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Con Ing	Head, anor, nau, vomit, diarr, irrit resp sys, [carc]	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, CNS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBA	Inh Abs Ing Con	Nau, vomit, diarr, abdom cramps; head; fvr; enl liv; jaun; reduced function of liv, kid, and lungs; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Liver, kidney, lungs

N-Nitrosodimethylamine

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Nitrotoluene $NO_2C_6H_4H_3$ 0-88-72-2 M-99-08-1 P-99-99-0 XT3150000 XT2975000 XT3325000 1664 55	Orthonitrotoluene, o-Nitrotoluol, Metanitrotoluene, m-Nitrotoluol, Paranitrotoluene, p-Nitrotoluol	5 ppm (30 mg/m³) (ACGIH) 2 ppm (11 mg/m³)	200 ppm	Ortho/meta: Yellow liquid or solid, weak, aromatic odor Para: Pale yellow solid; weak, aromatic color	MW: 137 BP: 432/450/460 °F Sol: 0.06/0.05/ 0.005% Fl.P: 223/214/ 223 °F IP: 9.65/9.79 eV	VP: 0.15/0.15/ 0.12 MP: 25/61/ 126 °F UEL: ? LEL: 2.2/1.6/ 1.6%	Strong oxidizers, sulfuric acid	SiO_2; CH_3OH; GC; Q
Octachloro-naphthalene $C_{10}Cl_8$ 2234-13-1 QK0250000	Halowax 1051	0.1 mg/m³	200 mg/m³	Pale yellow solid with an aromatic odor	MW: 404 BP: ≅770 °F Sol: Insoluble Not combustible	VP: < 1 mm MP: 365 °F	Strong oxidizers	Filter; hexane; GC; G
Octane C_8CH_{18} 111-65-9 RG8400000 1262 27	Normal octane	500 ppm (2350 mg/m³) (NIOSH) 75 ppm 10-hr TWA 385 ppm 15-min ceil (ACGIH) 300 ppm	3750 ppm	Colorless liquid with a gasoline-like odor	MW: 114 BP: 258 °F Sol: ≅0.04% Fl.P: 56 °F IP: 9.9 eV	VP: 11 mm MP: -70 °F UEL: 6.5% LEL: 1%	Strong oxidizers	Char; CS_2; GC; III
Oil mist (mineral) 8012-95-1 PY8030000 1270 27	Mist of white mineral oil,.cutting oil, heat-treating oil, hydraulic oil, cable oil, lubricating oil	5 mg/m³	N.A.	Mist with an odor like burned lube oil	MW: N.A. BP: 680 °F Sol: Insoluble Fl.P: 275 °F	VP: Very low MP: Very low UEL: N.A. LEL: N.A.	None hazardous	Filter; chloroform; fluoro-spectro; S

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 20 ppm: SA^{4}/SCBA^{4} 50 ppm: SA:CF^{4} 100 ppm: SCBAF/SAF/SAT:CF^{4} 200 ppm: SA:PD,PP^{4} Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Anoxia, cyan, head, weak, dizz, ataxia, dysp, tachycardia, nau, vomit	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Blood, CNS, CVS, skin, GI tract
Clothing: AP molten/RP sol-liq Goggles: AP molten/Reas sol-liq Wash: Prompt upon contam/daily Change: After work it may be contam Remove: Non-imperv contam; molten imm/sol-liq pro	OSHA 1 mg/m^{3}: SA/SCBA 2.5 mg/m^{3}: SA:CF 5 mg/m^{3}: SCBAF/SAF/SAT:CF 100 mg/m^{3}: SA:PD,PP 200 mg/m^{3}: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing Con	Acneform derm, liver damage, jaun	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Skin, liver
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 750 ppm: SA^{4}/SCBA^{4} 1857 ppm: SA:CF^{4} 3750 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con Ing	Irrit eyes, nose; drow; derm; chem pneumonia	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys
Clothing: Repeat prolong Goggles: N.A. Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	OSHA 50 mg/m^{3}: SA/SCBA/HiE 125 mg/m^{3}: SA:CF/PAPRHiE 250 mg/m^{3}: HiEF/PAPRTHiE/ SAT:CF/SCBAF/SAF 2500 mg/m^{3}: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh	None reported	Skin: Soap wash Breath: Fresh Air	Resp sys, skin

Oil mist (mineral)

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Osmium tetroxide OsO_4 20816-12-0 RN1140000 2471 55	Osmic acid	0.002 mg/m³ (ACGIH) 0.0002 ppm (0.002 mg/m³)	1 mg/m³	Colorless to pale yellow solid with an odor like chlorine; sharp and choking	MW: 254 BP: 266°F Sublimes Sol: 7% Not combustible	VP: 7 mm MP: 108°F	Hydrochloric acid, easily oxidized organic materials	—
Oxalic acid $HOOCCOOH \cdot 2H_2O$ 144-62-7 RO2450000 2449 54	Oxalic acid dihydrate, Ethane dioic acid	1 mg/m³	500 mg/m³	Colorless, odorless solid	MW: 126 BP: 300 to 320°F Sublimes Sol: 10% Fl.P: None	VP: <0.001 mm MP: 215°F UEL: ? LEL: ?	Strong oxidizers, silver	—
Oxygen difluoride OF_2 7783-41-7 RS2100000 2190 20	Difluorine monoxide, Fluorine monoxide	0.05 ppm (0.1 mg/m³)	0.5 ppm	Colorless gas with a foul odor	MW: 54 BP: -229°F Sol: 0.02% Not combustible, but strong oxidizer IP: 13.13 eV	VP: >1 atm MP: -371°F	All combustible materials, chlorine, bromine, iodine, platinum, metal oxides, moist air	—
Ozone O_3 10028-15-6 RS8225000	None	0.1 ppm (0.2 mg/m³)	10 ppm	Colorless gas with a very pungent, characteristic odor, associated with electrical sparks	MW: 48 BP: -170°F Sol: 0.00003% Fl.P: N.A. IP: 12.67 eV	VP: N.A. MP: -313°F UEL: N.A. LEL: N.A.	All oxidizable materials, both organic and inorganic	Imp (KI/NaOH); phosphoric sulfamic acid; color; B

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Any poss Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv Provide: Eyewash	OSHA 0.1 mg/m^3: SAF/SCBAF/CCRSFHiE/GMFSHiE 1 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFSHiE/SCBAE	Inh Ing Con	Lac, vis dist, conj; head; cough; dysp, derm; skin burns; kidney damage	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin
Clothing: Repeat Prolong Goggles: Any poss Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 25 mg/m^3: PAPRDMψ/SA:CFψ 50 mg/m^3: HiEF/SCBAF/SAF 500 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiE/SCBAE	Inh Abs Ing Con	Irrit eyes, muc memb, skin; eye burns; local pain; cyan; shock, collapse, convul	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, kidneys, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 0.5 ppm: SCBA/SA Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS^1/SCBAE	Inh Con	Intractable headache, resp sys irrit; pulm edema; eye, skin burns	Eye: Irr immed Skin: Water flush immed Breath: Medical attention immed	Lungs, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 1 ppm: SA/SCBA/CCRS^1 2.5 ppm: SA:CF/PAPRS^1 5 ppm: CCRSF^1/GMFS^1/SCBAF/SAF/SAT:CF 10 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS^1/SCBAE	Inh	Irrit eyes, muc memb, pulm edema, chronic resp disease	Eye: Medical aid Breath: Fresh air, 100% O_2	Eyes, resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Paraquat compounds 2568 53	Synonyms vary depending upon specific compound	0.5 mg/m³ (ACGIH) 0.1 mg/m³ (respirable sizes)	1.5 mg/m³	Odorless colorless solids	MW: 257 to 408 BP: Decomposes at 347 to 356°F Sol: Very soluble Not combustible	VP: ≈0 mm MP: ?	Strong oxidizers	Filter; H_2O; HPLC; III
Parathion $(C_2H_5O)_2PSOC_6H_4NO_2$ 56-38-2 TF4550000 2783 55	o,o-Diethyl-o,p-nitrophenyl phosphorothioate, Ethyl parathion	0.1 mg/m³ (NIOSH) 0.05 mg/m³ 10-hr TWA	20 mg/m³	Yellow to dark brown liquid with an odor like garlic	MW: 291 BP: 707°F Sol: 0.00002% Not combustible	VP: 0.0004 mm MP: 43°F pure 32°F tech	Strong oxidizers	Filter; iso-octane; GC; III
Pentaborane B_5H_9 19624-22-7 RY8925000 1380 75	Stable pentaborane, Pentaboron nonahydride	0.005 ppm (0.01 mg/m³)	3 ppm	Colorless liquid with a strong pungent odor	MW: 63 BP: 137°F Sol: Reacts Fl.P: 86°F IP: 10.5 eV	VP: 171 mm MP: -52°F UEL: ? LEL: 0.42%	Oxidizers, halogens, halogenated compounds; impure material ignites spontaneously	—
Pentachloronaphthalene $C_{10}H_3Cl_5$ 1321-64-8 QK0300000	Halowax 1013	0.5 mg/m³	N.A.	Pale yellow solid with an aromatic odor	MW: 301 BP: 620 to 700°F Sol: Insoluble Not combustible	VP: <1 mm MP: 248°F	Strong oxidizers	Filter & bub; iso-octane; GC; G

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	ACGIH 1 mg/m^3: CCROVDMFu*/SA*/SCBA 1.5 mg/m^3: CCRFOVDMFu/SA:CF* SCBAF/SAF/PAPROVDMFu* Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, epis; derm; fingernail damage; irrit GI; heart, liver, kidney damage; acute pulm inflamm	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, heart, liver, kidneys, GI tract
Clothing: Repeat prolong Goggles: Any poss Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH 0.5 mg/m^3: CCROVDMFu/SA/SCBA 1.25 mg/m^3: SA:CF/PAPROVDMFu 2.5 mg/m^3: CCRFOVHIE/SAF/SCBAF/ PAPRHIEOV/SAT:CF 20 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Miosis; rhin; head; chest wheez, lar spas; salv; cyan; anor, nau, abdom cramp, diarr, sweat; musc fasc; weak, para, atax, convuls, low BP; card, derm	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CNS, CVS, eyes, skin, blood cholinesterase
Clothing: Reason prob Goggles: Any poss Wash: Immed upon wet Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	OSHA 0.05 ppm: SA/SCBA 0.125 ppm: SA:CF 0.25 ppm: SCBAF/SAF/SAT:CF 1 ppm: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Dizz, head, drow, li-head, inco; tremor, tonic spas face, neck, abdom, limbs; convuls; irrit eyes, skin	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, eyes, skin
Clothing: AP molten/RP sol-liq Goggles: AP molten/Reas sol-liq Wash: Promptly upon contam Change: After work if may be contam Remove: Non-imperv contam, molten imm/sol-liq pro	OSHA 5 mg/m^3: SA*/SCBA* 12.5 mg/m^3: SA:CF* 25 mg/m^3: SCBAF/SAF/SAT:CF* 500 mg/m^3: SA:PD,PP* 1000 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GM[illegible]EOV/SCBAE	Inh Ing Con	Head, ftg, verti, anor, puritis, acneform skin eruptions, jaun, liver necrosis	Eye: Irr immed Skin: Soap promptly/flush immed molten Breath: Art resp Swallow: Medical attention immed	Skin, liver, CNS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Pentachlorophenol C_6Cl_5OH 87-86-5 SM6300000 2020 53	PCP, Penta	0.5 mg/m³	150 mg/m³	Light-brown solid with a pungent odor when hot	MW: 266 BP: 592 °F Sol: 0.002% Not combustible	VP: 0.0002 mm MP: 360 to 374 °F	Strong oxidizers	NIOSH 77-157A
Pentane C_5H_{12} 109-66-0 RZ9450000 1265 27	Normal pentane	1000 ppm (2950 mg/m³) (NIOSH) 120 ppm (350 mg/m³) 10-hr TWA (ACGIH) 600 ppm	5000 ppm	Colorless liquid with a gasoline-like odor	MW: 72 BP: 97 °F Sol: 0.04% Fl.P: -57 °F IP: 10.35 eV	VP: 426 mm MP: -200 °F UEL: 7.8% LEL: 1.5%	Strong oxidizers	Char; CS_2; GC; III
2-Pentanone $CH_3COC_3H_7$ 107-87-9 SA7875000 1249 26	Methyl propyl ketone, Ethyl acetone, MPK	200 ppm (700 mg/m³) (NIOSH) 530 mg/m³ (150 ppm) 10-hr TWA	5000 ppm	Water-white liquid with a characteristic ketone odor	MW: 86 BP: 216 °F Sol: 4.3% Fl.P: 45 °F IP: 9.37 eV	VP: 27 mm MP: -108 °F UEL: 4.3% LEL: 1.5%	Oxidizing agents	Char; CS_2; GC; III
Perchloromethyl mercaptan CCl_3SCl 594-42-3 PB0370000 1670 55	PMM, Trichloromethyl sulfur chloride	0.1 ppm (0.8 mg/m³)	10 ppm	Pale yellow, oily liquid with a foul-smelling, strong, acrid odor	MW: 186 BP: 300 °F Sol: Insoluble Not combustible	VP: 65 mm MP: ?	Alkalies, amines, hot iron, hot water	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 5 mg/m^3: CCROVDMFu[4]/SA[4]/SCBA[4] 12.5 mg/m^3: SA:CF[4]/PAPROVDMFu[4] 25 mg/m^3: CCROFVHIE/SAF/SCBAF 150 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat; sneez, cough; weak, anor, low-wgt; sweat; head; dizz; nau, vomit; dysp, chest pain; derm	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CVS, resp sys, eyes, liver, kidneys, skin, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 1200 ppm: SA/SCBA 3000 ppm: SA:CF 5000 ppm: SCBAF/SAF/SAT:CF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Drow; irrit eyes, nose; derm; chem pneumonia	Eye: Irr immed Skin: Water wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: CCROV[4]/PAPROV[4] 1500 ppm: SA [4]/SCBA[4] 3750 ppm: SA:CF[4] 5000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb; head; derm; narcosis, coma	Eye: Irr immed Skin: Water flush Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	OSHA 1.0 ppm: SA[4]/SCBA[4]/CCROV[4] 2.5 ppm: SA:CF[4]/PAPROV[4] 5 ppm: CCROVF/GMFOV/SCBAF/SAF/ SAT:CF[4]/PAPRTOV[4] 10 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Lac, eye inflamm; irrit nose, throat; cough; dysp; deep breath pain, coarse rales; vomit; pallor; tachycardia; acidosis; anuria	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, liver, kidneys, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Perchloryl fluoride ClO_3F 7616-94-6 SD1925000 1955 15	Chlorine oxyfluoride	3 ppm (13.5 mg/m³) (ACGIH) 3 ppm (14 mg/m³)	385 ppm	Colorless gas with a characteristic, sweet odor	MW: 103 BP: -52°F Sol: 0.06% Not combustible IP: 13.6 eV	VP: > 1 atm MP: -232°F	Combustibles, strong bases, amines, finely divided metals; oxidizable materials	—
Petroleum distillates (naphtha) 8002-05-9 SE7449000 1268 27	Petroleum naphtha; Aliphatic petroleum naphtha; Petroleum ether (95 to 115°C); Naphtha, petroleum	500 ppm (2000 mg/m³) (NIOSH) 350 mg/m³ 10-hr TWA 1800 mg/m³ 15-min ceil	10,000 ppm	Colorless liquid with an odor like gasoline and kerosene	MW: ≅100 BP: 86 to 260°F Sol: ≅0.04% Fl.P: -40 to -86°F	VP: ≅40 mm MP: ? UEL: 6% LEL: 1%	Strong oxidizers	Char; CS_2; GC; III
Phenol C_6H_5OH 108-95-2 SJ3325000 1671 55 2821 55	Carbolic acid, Monohydroxy benzene	5 ppm (19 mg/m³) (NIOSH) 20 mg/m³ 10-hr TWA (5.2 ppm) 60 mg/m³ 15-min ceil (15.6 ppm)	100 ppm	Colorless to pink solid or thick liquid with a characteristic, sweet, tarry odor	MW: 94 BP: 359°F Sol: 8.4% FL.P: 174°F IP: 8.5 eV	VP: 0.36 mm MP: 106°F UEL: 8.6% LEL: 1.7%	Strong oxidizers, calcium hypochlorite	Bub (NaOH); H_2SO_4; GC; III
p-Phenylene diamine $C_6H_8N_2$ 106-50-3 SS8050000 1673 53	p-Diamino benzene; 1,4-Diaminobenzene	0.1 mg/m³	25 mg/m³	White to light purple or brown solid	MW: 108 BP: 512°F Sol: 4.7% Fl.P: 312°F IP: 7.58 eV	VP: Very low MP: 286°F MEC: 0.025 g/l	Strong oxidizers	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Prevent skin freezing Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Immed contam non-imperv	OSHA 30 ppm: SA/SCBA 75 ppm: SA:CF[a] 150 ppm: SCBAF/SAF 385 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS[d]/SCBAE	Inh Con	Resp irrit; skin burns; in animals: methemoglobinemia	Eye: Irr immed Breath: Art resp	Resp sys, skin, blood
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 850 ppm: SCBA/SA 2125 ppm: SA:CF[a] 4250 ppm: SCBAF/SAF/SAT:CF[a] 10,000 ppm: SA:PD,PP[a] Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Dizz, drow; head; nau; irrit eyes, nose, throat; dry cracked skin	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys, CNS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 50 ppm: CCROVDM/SA/SCBA 100 ppm: SA:CF/PAPROVDM/ SCBAF/SAF/GMFOVDM/CCRFOVDM Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat, anor, low-wgt; weak, musc ache, pain; dark urine; cyan; liver, kidney damage; skin burn; derm; ochronosis; tremor, convuls; twitch	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Liver, kidneys, skin
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon contam/daily Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 2.5 mg/m³: SA:CF[a] 5 mg/m³: SAF/SCBAF 25 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFSHIE/SCBAE	Inh Ing Con	Irrit pharynx, larynx; bron asth; sens derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin

p-Phenylene diamine

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Phenyl ether $(C_6H_5)_2O$ 101-84-8 KN8970000	Diphenyl ether, Diphenyl oxide	1 ppm (7 mg/m^3)	N.A.	Colorless solid or liquid with a somewhat disagreeable odor	MW: 170 BP: 498°F Sol: 0.0021% Fl.P: 239°F IP: 12.90 eV	VP: <1 mm MP: 81°F UEL: 1.5% LEL: 0.8%	Strong oxidizers	Char; CS_2; GC; F
Phenyl ether-biphenyl mixture $(C_6H_5)_2O$ and $C_6H_5C_6H_5$ 8004-13-5 DV1500000	Dowtherm A, Diphenyl oxide-diphenyl mixture	1 ppm (7 mg/m^3)	N.A.	Straw-colored liquid, which darkens on use, with an aromatic, somewhat disagreeable odor	MW: 166 BP: 495°F Sol: 0.0014% Fl.P(oc): 255°F	VP(77°F): 0.08 mm MP: 54°F UEL(500°F): 6.2% LEL: 0.5%	Strong oxidizers	SiO_2; C_6H_6; GC; F
Phenyl glycidyl ether $C_6H_5OCH_2CHOCH_2$ 122-60-1 TZ3675000	Glycidyl phenyl ether; Phenyl epoxypropyl ether; 1,2-Epoxy-3-phenoxy-propane; PGE	10 ppm (60 mg/m^3) (NIOSH) 1 ppm 15-min ceil (5 mg/m^3) (ACGIH) 1 ppm	N.A.	Colorless liquid	MW: 150 BP: 473°F Sol: Very low Fl.P: 248°F	VP: 0.01 mm MP: 38°F UEL: ? LEL: ?	Strong oxidizers, amines, strong acids, strong bases	Char; CS_2; GC; F
Phenylhydrazine $C_6H_5NHNH_2$ 100-63-0 MV8925000 2572 53	Hydrazinobenzene	5 ppm (22 mg/m^3) (NIOSH) 0.14 ppm (0.6 mg/m^3) 120-min ceil See Appendix A (ACGIH) 5 ppm, A2	250 ppm Ca	Colorless to pale yellow solid or liquid with a weak, aromatic odor	MW: 108 BP: 469°F Sol: Slight Fl.P: 192°F IP: 7.66 eV	VP: < 0.1 mm MP: 68°F UEL: ? LEL: ?	Strong oxidizers, lead dioxide	Bub(HCl); phosphomolybdic acid; color; L

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-contam	OSHA 25 ppm: SA:CF•PAPROVDM• 50 ppm: CCRFOVHIE/GMFHIEOV/ SCBAF/SAF 100 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOVHIE/SCBAE	Inh Con Ing	Nau; irrit eyes, nose, skin	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	OSHA 25 ppm: SA:CF•/PAPROVDM• 50 ppm: CCROVHIE/GMFHIEOV/ SCBAF/SAF 100 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOVHIE/SCBAE	Inh Con Ing	Nau; irrit eyes, nose, skin	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Any poss Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	NIOSH 25 ppm: SA:CF• 50 ppm: SCBAF/SAF 500 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con Ing	Skin irrit, sens; irrit eyes, upper resp; narcosis	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, CNS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/ daily Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Abs Ing Con	Skin sensitization, hemolytic anemia, dysp, cyan, jaun; kidney damage; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Blood, resp sys, liver, kidneys, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Phosdrin $C_7H_{13}O_4PO_2$ 7786-34-7 GQ5250000 2783 55	Mevinphos® 2-Carbomethoxy-1-methylvinyl dimethyl phosphate	0.1 mg/m³	40 mg/m³	Colorless or yellow liquid with a weak odor	MW: 224 BP: 617°F Sol: Miscible Fl.P(oc): 175°F	VP: 0.003 mm MP: -69°F UEL: ? LEL: ?	Strong oxidizers	Ads; toluene; GC; III
Phosgene $COCl_2$ 75-44-5 SY5600000 1076 15	Carbonyl chloride, Carbon oxychloride, Chloroformyl chloride	0.1 ppm (0.4 mg/m³) (NIOSH) 0.1 ppm 10-hr TWA 0.2 ppm 15-min ceil	2 ppm	Colorless liquid or gas with a sweet odor like hay at low concentrations; sharp, pungent odor at high concentrations	MW: 99 BP: 47°F Sol: Reacts Not combustible IP: 11.7 eV	VP: N.A. MP: -198°F	Moisture	NIOSH 77-157A
Phosphine PH_3 7803-51-2 SY7525000 2199 18	Hydrogen phosphide, Phosphorus hydride, Phosphorated hydrogen	0.3 ppm (0.4 mg/m³)	200 ppm	Colorless gas with a characteristic, fishy odor	MW: 34 BP: -126°F Sol: 0.04% Fl.P: N.A. IP: 9.98 eV	VP: >1 atm MP: -209°F UEL: ? LEL: ?	Air, oxidizers, chlorine, acids, moisture, halogenated hydrocarbons	NIOSH 79-141
Phosphoric acid H_3PO_4 7664-38-2 TB6300000 1805 60	White phosphoric acid, Orthophosphoric acid, 85% Phosphoric acid, Metaphosphoric acid	1 mg/m³	N.A.	Viscous, colorless, odorless liquid; solidifies at <70°F	MW: 98 BP: 500°F Sol: Miscible Not combustible	VP: 0.03 mm MP: 70°F	Strong caustics, most metals	SiO_2; $NaHCO_3$; IC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 1 mg/m^3: SA/SCBA 2.5 mg/m^3: SA:CF 5 mg/m^3: SAF/SCBAF/SAT:CF 40 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Miosis; rhin; head; chest, wheez, lar spas; salv, cyan; anor; nau, abdom cramp, diarr; para, atax, convul; low BP; card; irrit skin, eyes	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CNS, CVS, skin, blood cholinesterase
Clothing: Reason prob Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Quick drench	NIOSH 1 ppm: SA[4]/SCBA[4] 2 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	Irrit eyes; dry burning throat; vomit; cough, foamy sputum, dysp, chest pain; cyan; skin burns	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 3 ppm: SA/SCBA 7.5 ppm: SA:CF 15 ppm: SCBAF/SAF/GMFS 200 ppm: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: Hief/SCBAE	Inh	Nau, vomit, abdom pain, diarr; thirst; chest pressure, dysp; musc pain; chills; stupor or syncope	Breath: Art resp	Resp sys
Clothing: >1.6% AP/<1.6% RP Goggles: Any poss Wash: Immed upon contam Change: After work it may be contam sol Remove: Immed contam non-imperv Provide: >1.6% eyewash, quick drench	OSHA 25 mg/m^3: SA:CF[4] 50 mg/m^3: SAF/SCBAF/HIEF 2000 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiE/SCBAE	Inh Ing Con	Irrit upper resp tract, eyes, skin; burns skin, eyes; derm	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Phosphorus (yellow) P_4 7723-14-0 TH3500000 1381 38	White phosphorus; WP; Phosphorus, elemental, white	0.1 mg/m^3	N.A.	White to yellow, soft, waxy solid with acrid fumes in air	MW: 124 BP: 535°F Sol: 0.0003% Fl.P: Spontaneous in air >86°F	VP: 0.026 mm MP: 111°F UEL: N.A. LEL: N.A.	Air, all oxidizing agents, including elemental sulfur, strong caustics	Tenax; Xylene; GC; Set 5
Phosphorus pentachloride PCl_5 10026-13-8 TB6125000 1806 39	None	1 mg/m^3	200 mg/m^3	Pale yellow solid with an odor like hydrochloric acid	MW: 208 BP: 333°F Sol: Reacts Not combustible	VP: <1 atm MP: 333°F	Water; magnesium oxide; chemically active metals: sodium, potassium; alkalies	NIOSH 79-141
Phosphorus pentasulfide P_2S_5 or P_4S_{10} 1314-80-3 TH4375000 1340 41	Phosphorus persulfide, Regular phosphorus pentasulfide, Reactive phosphorus pentasulfide, Distilled phosphorus pentasulfide, Undistilled phosphorus pentasulfide	1 mg/m^3	750 mg/m^3	Greenish-yellow solid with an odor of rotten eggs	MW: 222 or 445 BP: 955°F Sol: Reacts Fl.P: ?	VP(572°F): 1 mm MP: 527°F MEC: ?	Water, alcohols, strong oxidizers	—
Phosphorus trichloride PCl_3 7719-12-2 TH3675000 1809 39	Phosphorus chloride	0.5 ppm (3 mg/m^3) (ACGIH) 0.2 ppm (1.5 mg/m^3)	50 ppm	Colorless to yellow, fuming liquid with an odor like hydrochloric acid	MW: 137 BP: 168°F Sol: Reacts Not combustible IP: 9.91 eV	VP: 100 mm MP: -169°F	Water, alcohol, when in contact with combustible organics; chemically active metals; sodium, potassium, aluminum, strong nitric acid	NIOSH 79-141

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any immed contam Provide: Eyewash, quick drench	OSHA 1 mg/m³: DMF 2.5 mg/m³: PAPRHiE$^{\blacktriangledown}$/SA:CF$^{\blacktriangledown}$ 5 mg/m³: SCBAF/SAF/HiEF 200 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit eyes, resp tract; abdom pain, nau; jaun; anemia; cachexia; dent pain; excess salv; jaw pain; swell; burns skin, eyes	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, liver, kidneys, jaw, teeth, blood, eyes, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work it may be contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 10 mg/m³: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 25 mg/m³: SA:CF$^{\blacktriangle}$ 50 mg/m³: SAF/SCBAF 200 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing Con	Irrit eyes, resp sys; bronchitis; derm	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 10 mg/m³: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 25 mg/m³: SA:CF$^{\blacktriangle}$ 50 mg/m³: SCBAF/SAF 750 mg/m³: SA:PD,PP$^{\blacktriangle}$ Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFSHiE/SCBAE	Inh Ing Con	Apnea; coma, convuls; irrit eyes, conj pain, lac, photophobia, keratoconj corn vesic; irrit resp sys; dizz; head; ftg; irrity, insom; GI dist	Eye: Irr immed Skin: Dust off solid; water flush Breath: Art resp Swallow: Medical attention immed	Resp sys, CNS, eyes, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	ACGIH 10 ppm: SCBAF/SAF 50 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS^{z}/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; pulm edema; burns eyes, skin	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Phthalic anhydride $C_6H_4(CO)_2O$ 85-44-9 TI3150000 2214 60	PAN	2 ppm ($12\ mg/m^3$) (ACGIH) 1 ppm ($6\ mg/m^3$)	10,000 ppm	White solid with a characteristic, choking odor	MW: 148 BP: 543°F Sol: 0.62% Fl.P: 304°F	VP: <0.05 mm MP: 268°F UEL: 10.4% LEL: 1.7%	Strong oxidizers	Filter; NH_4OH; HPLC; M
Picric acid $HOC_6H_2(NO_2)_3$ 88-89-1 TJ7875000 1344 33	2,4,6-Trinitrophenol; Lyddite; Pertite; Shimose; Melinite	$0.1\ mg/m^3$	100 mg/m^3	Colorless, yellow solid or liquid	MW: 229 BP: >572°F Sol: 1.4% Fl.P: 302°F	VP: <<1 mm MP: 252°F UEL: ? LEL: ?	Copper, lead, zinc, other metals, salts, plaster, concrete	Filter; CH_3OH/H_2O; HPLC; Set 4
Pival® $C_{14}H_{14}O_3$ 83-26-1 NK6300000 2472 53	2-Pivalyl-1,3-indandione; Pivalyl; Pindone; tert-Butyl-valone; 1,3-Dioxo-2-pivaloy-lindane	$0.1\ mg/m^3$	200 mg/m^3	0.5% concentration: inert solid, bright yellow with almost no odor; usually as a dust	MW: 230 BP: ? Sol: 0.0018% Fl.P: ?	VP: ? MP: 230°F UEL: ? LEL: ?	None hazardous	—
Platinum (soluble salts as Pt) Pt 7440-06-4 TP2160000	Synonyms vary depending upon specific compound	$0.002\ mg/m^3$	N.A.	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		None hazardous	Filter; acid; AA M

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	ACGIH 5 ppm: DMXS^{a} 10 ppm: DMXSQ^{a}/SA^{a}/SCBA^{a} 25 ppm: SA:CF^{a}/PAPRDM^{a} 50 ppm: SAF/SCBAF/HIEF 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh Ing Con	Conj, nas ulc bleed, upper resp irrit, bron, asthma, derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin, liver, kidneys
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon contam/daily Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 0.5 mg/m^3: DMXS 1 mg/m^3: DMXSQ/SA/SCBA 2.5 mg/m^3: PAPRDM/SA:CF 5 mg/m^3: HIEF/SCBAF/SAF/PAPRTHIEV/SAT:CF 100 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHIE/SCBAE	Inh Con	Irrit eyes; sens derm; yellow-stain hair, teeth; weak, myalgia, anuria, polyuria; bitter taste, GI; hepatitis; hematuria, albuminuria; neph	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Kidneys, liver, blood, skin, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: After work it may be contam Remove: N.A.	OSHA 0.5 mg/m^3: DMXS 1 mg/m^3: DMXSQ/SA/SCBA/HiE 2.5 mg/m^3: PAPRDM/SA:CF 5 mg/m^3: PAPRTHiE/SCBAF/SAF/HiEF/SAT:CF 100 mg/m^3: SA:PD,PP 200 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh	Nosebleed, excess bleeding minor cuts, bruises; smokey urine, black tarry stools; pain abdom, back	Eye: Irr immed Swallow: Medical attention immed	Blood prothrombin
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 0.05 mg/m^3: SA:CF* 0.1 mg/m^3: HIEF/SCBAF/SAF 4 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh Ing Con	Irrit eyes, nose; cough, dysp, wheez, cyan; skin sensitization; lymphocytosis	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medial attention immed	Resp sys, skin, eyes

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Portland cement (less than 1% quartz) 65997-15-1 VV8770000	Hydraulic cement, Cement, Portland cement silicate	50 mppcf (ACGIH) 30 mppcf 10 mg/m^3 (total dust <1% quartz) 5 mg/m^3 (resp dust)	N.A.	Odorless, gray powder with <1% crystalline silica	MW: Variable BP: N.A. Sol: Insoluble Not combustible	VP: ≅0 mm MP: N.A.	None hazardous	—
Propane $CH_3CH_2CH_3$ 74-98-6 TX2275000 1978 22	Dimethyl methane	1000 ppm (1800 mg/m^3) (ACGIH) simple asphyxiant	20,000 ppm	Color, odorless gas (foul-smelling odorant often added)	MW: 44 BP: -44°F Sol: Insoluble Fl.P: N.A. IP: 10.95 eV	VP: 8.6 atm MP: -306°F UEL: 9.5% LEL: 2.2%	Strong oxidizers	Combustible gas meter; G
beta-Propiolactone $C_3H_4O_2$ 57-57-8 RQ7350000 1848 29	Hydroacrylic acid, beta-lactone; 3-Hydroxy-propionic acid; beta-Lactone; 2-Oxetanone; Betaprone; Propanolide; Propiolactone; Propionic acid; 3-Hydroxy-beta-lactone; beta-Propiolactone; beta-Proprolactone; BPL	See Appendix C (NIOSH) (ACGIH) 0.5 ppm, A2	Ca	Colorless liquid with a slightly sweetish odor	MW: 72.1 BP: Decomposes at 323°F Sol: 37 v/v at 25°C Fl.P: 158°F	VP: 3.4 at 25°C MP: -28°F UEL: ? LEL: 2.9	Acetates, halogens, thiocyanates, and thiosulphates	—
n-Propyl acetate $CH_3COOCH_2CH_2CH_3$ 109-60-4 AJ3675000 1276 26	Propylacetate; Acetic acid, n-propyl ester	200 ppm (840 mg/m^3)	8000 ppm	Colorless liquid with a mild, fruity odor	MW: 102 BP: 215°F Sol: 2% Fl.P: 58°F IP: 10.07 eV	VP: 25 mm MP: -140°F UEL: 8% LEL: 2%	Nitrates; strong oxidizers, alkalies, and acids	Char; CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 150 mppcf: D 300 mppcf: SA/SCBA/DXSQ 750 mppcf: PAPRD/SA:CF 1500 mppcf: SCBAF/SAF/HiEF/SAT:CF 25,000 MPPCF: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con Ing	Irrit eyes, nose; cough, expectoration; exertional dysp, wheez, chron bron; derm	Eye: Irr immed Skin: Soap wash promptly Breath: Fresh air Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: Prevent skin freezing Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Any wet immed (flamm)	OSHA 10,000 ppm: SA/SCBA 20,000 ppm: SA:CF/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: SCBAE	Inh Con	Dizz, disorientation, excitation, frostbite	Eye: Irr immed Skin: Water flush immed Breath: Art resp	CNS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP: ASCBA ESCAPE: GMFOV/SCBAE	Inh Abs Ing Con	Skin irrit, blistering, burns; corn opac; frequent urination, dys; hema; [carc]	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Kidney, skin, lungs, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV•/GCRFOV 5000 ppm: SA:CF• 8000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con Ing	Irrit eyes, nose, throat; narco; derm	Eye: Irr immed Skin: Water flush promptly Breath: Art resp	Resp sys, eyes, skin, CNS

n-Propyl acetate

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Propyl alcohol $CH_3CH_2CH_2OH$ 71-23-8 UH8225000 1274 26	n-Propyl alcohol, 1-Propanol, Ethyl carbinol	200 ppm (500 mg/m³)	4000 ppm	Colorless liquid with a mild, non-residual, alcoholic odor	MW: 60 BP: 207 °F Sol: Miscible Fl.P: 59 °F IP: 10.22 eV	VP: 15 mm MP: -195 °F UEL: 14% LEL: 2%	Strong oxidizers	Char; 2-Propanol in CS_2; GC; III
Propylene dichloride $CH_3CHClCH_2Cl$ 78-87-5 TX9625000 1279 27	1,2-Dichloropropane	75 ppm (350 mg/m³)	2000 ppm	Colorless liquid with an odor like chloroform	MW: 113 BP: 205 °F Sol: 0.26% Fl.P: 60 °F IP: 10.87 eV	VP: 40 mm MP: -148 °F UEL: 14.5% LEL: 3.4%	Strong oxidizers and acids	Char; CS_2; GC; III
Propyleneimine C_3H_7N 75-55-8 CM8050000 1921 30	2-Methylaziridine	2 ppm (5 mg/m³) (ACGIH) 2 ppm, A2	500 ppm	Fuming, colorless liquid with a strong ammonia-like odor	MW: 57 BP: 151 °F Sol: Miscible Fl.P: 25 °F	VP: ? MP: -85 °F UEL: ? LEL: ?	Acids, strong oxidizers	—
Propylene oxide CH_3CHOCH_2 75-56-9 TZ2975000 1280 26	1,2-Epoxy propane, Propene oxide, Methyloxirane	100 ppm (240 mg/m³) (ACGIH) 20 ppm (50 mg/m³)	2000 ppm	Colorless liquid with an ether-like odor	MW: 58 BP: 94 °F Sol: 41% Fl.P: -35 °F IP: 10.2 eV	VP: 442 mm MP: -170 °F UEL: 37% LEL: 2.1%	Anhydrous metal chlorides, iron; strong acids, caustics, peroxides	Char; CS_2; GC; F

				Health Hazards	
Personal Protection and Sanitation (See Table 2)	**Respirator Selection Upper Limit Devices Recommended (See Table 3)**	**Route**	**Symptoms (See Table 4)**	**First Aid (See Table 5)**	**Target Organs**
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV$^{\blacktriangle}$/ CCROV$^{\blacktriangle}$ 2000 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 4000 ppm: SA:CF$^{\blacktriangle}$/SAF/ GMFOV/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con Ing	Mild irrit eyes, nose, throat; dry cracking skin; drow, head; ataxia; GI pain; abdom cramps; nau, vomit, diarr	Eye: Irr immed Skin: Water flush Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys, GI tract
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 750 ppm: CCROV$^{\blacktriangle}$/SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 1000 ppm:PAPROV$^{\blacktriangle}$ 1875 ppm: SA:CF$^{\blacktriangle}$ 2000 ppm: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con Ing	Eye irrit, drow, li-head, irrit skin	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys, liver, kidneys
Clothing: Reason prob Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	OSHA 50 ppm: SA$^{\blacktriangledown}$:CF 100 ppm: SCBAF/SAF 500 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMS/SCBAE	Inh Abs Ing Con	Eye, skin burns	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin
Clothing: Any poss Goggles: Reason prob Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Quick drench	ACGIH 200 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 500 ppm: SA:CF$^{\blacktriangle}$ 1000 ppm: SAF/SCBAF 2000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Con Ing	Irrit eyes, upper resp, lungs; skin irrit, blister, burns	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
n-Propyl nitrate $C_3H_7NO_3$ 627-13-4 UK0350000 1865 30	None	25 ppm (110 mg/m³) (ACGIH) 25 ppm (105 mg/m³)	2000 ppm	Colorless to pale yellow liquid with an ether-like odor	MW: 105 BP: 231°F Sol: Insoluble Fl.P: 68°F	VP: 18 mm MP: <-150°F UEL: 100% LEL: 2%	Strong oxidizers, combustibles	Char; CS_2; GC; Q
Pyrethrum 8003-34-7 UR4200000 9184 31	Synonyms vary depending upon specific compound	5 mg/m³	5000 mg/m³	Viscous brown resin or solid	MW: 316 to 374 BP: N.A. Sol: Insoluble Fl.P(oc): 180 to 190°F	VP: ≈0 mm MP: ? UEL: ? LEL: ?	Strong oxidizers	NIOSH 80-125
Pyridine C_5H_5N 110-86-1 UR8400000 1282 26	Azabenzene, Azine	5 ppm (15 mg/m³)	3600 ppm	Colorless to yellow liquid with a penetrating, sickening odor	MW: 79 BP: 239°F Sol: Miscible Fl.P: 68°F IP: 9.27 eV	VP: 18 mm MP: -44°F UEL: 12.4% LEL: 1.8%	Strong oxidizers, strong acids	Char; CH_2Cl_2; GC; L
Quinone OC_6H_4O 106-51-4 DK2625000 2587 55	p-Benzoquinone	0.1 ppm (0.4 mg/m³)	75 ppm	Pale yellow solid with an acrid odor	MW: 108 BP: Sublimes Sol: 1.5% Fl.P: ? IP: 9.67 eV	VP: 0.1 mm MP: 235°F UEL: ? LEL: ?	Strong oxidizers	Ads; Ethanol/ hexane; HPLC; Set 4

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Immed contam non-imperv	OSHA 250 ppm: SA/SCBA 625 ppm: SA:CF 1250 ppm: SAF/SCBAF/SAT:CF 2000 ppm: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS[2]/SCBAE	Inh Ing Con	None known in humans	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	None known
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 50 mg/m^3: CCROVDMFu[4]/ SA[4]/SCBA[4] 125 mg/m^3: SA:CF[4]/PAPROVDMFu[4] 250 mg/m^3: CCRFOVHiE/SAF/SCBAF PAPRTOVHiE[4] 5000 mg/m^3: SA:PD,PP[4] Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing Con	Eryt derm, sneezing, asthma; in animals: convuls, paralysis	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, CNS
Clothing: Reason prob Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: Eyewash, quick drench	OSHA 125 ppm: SA:CF[*]/PAPROV[*] 250 ppm: CCRFOV/GMFOV/SCBAF/SAF 3600 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	head; nerv; dizz; insomnia; nau, anor; urine frequent; eye irrit; derm; liver, kidney damage	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, liver, kidneys, skin, GI tract
Clothing: Reason prob Goggles: Any poss Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 2.5 ppm: SA:CF[*] 5 ppm: SAF/SCBAF 75 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Ing Con	Eye irrit, conj keratitis; skin irrit; ulceration of skin	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Rhodium, metal fume and dust (as Rh) Rh 7440-16-6 VI9355000	Synonyms vary depending upon specific compound	0.1 mg/m³ (ACGIH) 1.0 mg/m³	N.A.	Gray fume or dust	MW: 103 BP: 4532°F Sol: Insoluble Not combustible	VP: ≅0 mm MP: 3570°F	None hazardous	Filter; acid; AA; M
Rhodium, soluble salts (as Rh) Rh 7440-16-6 VI9355000	Synonyms vary depending upon specific compound	0.001 mg/m³ (ACGIH) 0.01 mg/m³	N.A.	Red-brown, odorless solid or liquid	Properties vary depending upon specific compound		None hazardous	Filter; acid; AA; M
Ronnel $(CH_3O)_2PSOC_6H_2Cl_3$ 299-84-3 TG0525000 2922 59	Fenchlorophos; o,o-Dimethyl o-(2,4,5-trichlorophenyl)phosphorothioate	15 mg/m³ (ACGIH) 10 mg/m³	5000 mg/m³	White to tan, waxy solid	MW: 322 BP: Decomposes Sol: 0.0044% Not combustible	VP: 0.0008 mm MP: 95°F	Strong oxidizers	NIOSH 80-125
Rotenone (commercial) $C_{23}H_{22}O_6$ 83-79-4 DJ2800000 2922 59	Tubatoxin, "Cube", Derrin	5 mg/m³	5000 mg/m³	Colorless to red, odorless solid	MW: 394 BP: Decomposes Sol: 0.00002% Fl.P: ?	VP: ≅0 mm MP: 356°F UEL: ? LEL: ?	Strong oxidizers	Filter; CH_3CN; HPLC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 0.5 mg/m^3: DM[4] 1 mg/m^3: SA/SCBA/DMXSQ[4] 2.5 mg/m^3: PAPRDMFu/SA:CF 5 mg/m^3: HIEF/SCBAF/PAPRTHIE/SAF/SAT:CF 100 mg/m^3: SA:PD,PP 200 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh	None known in humans	Breath: Art resp Swallow: Medical attention immed	None known
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	OSHA 0.01 mg/m^3: HIE[4]/SA[4]/SCBA[4] 0.025 mg/m^3: PAPRHIE[4]/SA:CF[4] 0.05 mg/m^3: PAPRTHIE[4]/HIEF/SAF/SCBAF 1 mg/m^3: SA:PD,PP[4] 2 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh Ing Con	Mild eye irrit	Eye: Irr immed Skin: Water flush Breath: Art resp Swallow: Medical attention immed	Eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	ACGIH 100 mg/m^3: CCROVDMFu/SA/SCBA 250 mg/m^3: SA:CF/PAPROVDMFu 500 mg/m^3: SAF/SCBA/CCRFOVHIE/GMFHIEOV/PAPRTOVHIE[4] 5000 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Ing Con	In animals: chol inhibition; irrit eye; liver, kidney damage	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, liver, kidneys, blood plasma
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work any poss contam Remove: Promptly contam non-imperv	OSHA 5 mg/m^3: CCROVDMFu/SA/SCBA 125 mg/m^3: SA:CF/PAPROVDMFu 250 mg/m^3: SAF/SCBAF/CCRFOVHIE GMFHIEOV/SAT:CF/PAPRTOVHIE 5000 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Ing Con	Irrit eyes; numb muc memb; nau, vomit, abdom pain; musc tremor, inco, clonic convuls; stupor; pulm irrit; skin irrit	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	CNS, eyes, resp sys

Rotenone (commercial)

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Selenium and compounds (as Se) Se 7782-49-2 VS7700000 2658 53	Synonyms vary depending upon specific compound	0.2 mg/m^3	100 mg/m^3	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Acids, strong oxidizing agents	Filter; acid; AA; M
Selenium hexafluoride (as Se) SeF_6 7783-79-1 VS9450000 2194 15	None	0.05 ppm (0.4 mg/m^3) (ACGIH) 0.05 ppm (0.2 mg/m^3)	5 ppm	Colorless gas	MW: 193 BP: -31°F Sol: Insoluble Not combustible	VP: >1 atm MP: -38°F	None hazardous	—
Silica (amorphous) SiO_2 7631-86-9 VV7310000 1346 32	Diatomite, Silicon dioxide (amorphous), Diatomaceous earth, Diatomaceous silica	20 mppcf (ACGIH) 10 mg/m^3 (total dust)	N.A.	Colorless to gray, odorless powder	MW: 60 BP: N.A. Sol: Insoluble Not combustible	VP: ≅0 mm MP: 3100°F	Fluorine, oxygen difluoride, chlorine trifluoride	NIOSH 80-125
Silica (crystalline) SiO_2 14808-60-7 VV7330000	Quartz, Cristobalite, Tridymite	10 mg/m^3/ %SiO_2 + 2 (resp quartz) (NIOSH) 50 µg/m^3 10-hr TWA (resp free silica) (ACGIH) 0.1 mg/m^3 (resp quartz)	N.A.	Colorless, odorless solid, component of many mineral dusts	MW: 60 BP: 4046°F Sol: Insoluble Not combustible	VP: ≅0 mm MP: 2912°F	Powerful oxidizers: fluorine, chlorine trifluoride, manganese trioxide, oxygen difluoride, etc.	Filter; X-ray; ash; XRD, Color, or IR; III

		Health Hazards			
Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Recommendations vary depending upon specific compound	OSHA 2 mg/m^3: DMF[4]/SA[4]/SCBA[4] 75 mg/m^3: PAPRDM[44]/SA:CF[4] 10 mg/m^3: HiEF/SCBAF/SAF 100 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat; disturb vis; head; chill, fvr; dysp, bron; metal taste, garlic breath; GI; derm; blur eyes; skin	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Upper resp sys, eyes, skin, liver, kidneys, blood
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 0.5 ppm: SA/SCBA 1.25 ppm: SA:CF 2.5 ppm: SCBAF/SAF/SAT:CF 5 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Con	None known in humans, in animals: resp irrit, breath difficulties	Breath: Art resp	None known
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 100 mppcf: DM 200 mppcf: DMXSQ/SA/SCBA 500 mppcf: PAPRDM/SA:CF 1000 mppcf: HiEF/PAPR-THiE/SCBAF/SAF/SAT:CF 10,000 mppcf: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh	Pneumoconiosis	Eye: Irr immed	Resp sys
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	NIOSH 0.25 mg/m^3: DM 0.5 mg/m^3: DMXSQ/SA/SCBA 1.25 mg/m^3: PAPRD/SA:CF 2.5 mg/m^3: HiEF/SCBAF/PAPR-THiE/SAF/SAT:CF 50 mg/m^3: SA:PD,PP 100 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh	Cough, dysp, wheez, impaired pulm func, progressive symptoms	Eye: Irr immed Breath: Fresh air	Resp sys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Silver, metal, and soluble compounds (as Ag) Ag 7440-22-4 VW3500000	Synonyms vary depending upon specific compounds	0.01 mg/m^3 (ACGIH) 0.1 mg/m^3 (metal) 0.01 mg/m^3 (soluble compounds)	N.A.	Appearance and odor vary depending upon specific compounds	Properties vary depending upon specific compound		Acetylene, ammonia, hydrogen peroxide	Filter; acid; IEP; III
Soapstone $3MgO \cdot 4SiO_2 \cdot H_2O$ VV8780000	Massive talc, Steatite, Soapstone silicate	20 mppcf (ACGIH) 3 mg/m^3 (resp dust) 6 mg/m^3 (total dust)	N.A.	Odorless solid; < 10% tremolite, < 1% silica, crystalline	MW: 379 BP: N.A. Sol: Insoluble Not combustible	VP: ≅0 mm MP: N.A.	None hazardous	—
Sodium fluoroacetate $CH_2FCOONa$ 62-74-8 AH9100000 2629 53	1080, Sodium monofluoroacetate, SFA	0.05 mg/m^3	5 mg/m^3	Fluffy, colorless, odorless, hygroscopic solid (sometimes dyed black)	MW: 100 BP: Decomposes Sol: 111% Not combustible	VP: ≅0 mm MP: 392°F	None hazardous	NIOSH 79-141
Sodium hydroxide NaOH 1310-73-2 WB4900000 1823 60	Caustic soda, Soda lye, Lye	2 mg/m^3 (NIOSH) 2 mg/m^3 15-min ceil (ACGIH) 2 mg/m^3 ceil	200 mg/m^3	Colorless, odorless solid	MW: 40 BP: 2534°F Sol: 50% Not combustible	VP: ≅0 mm MP: 590°F	Water, acids, flammable liquids, organic halogens, metals: aluminum, tin, zinc; nitromethane and nitro compounds	Filter; 0.01 N HCl; titration (NaOH); III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Any poss Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv Provide: Eyewash	OSHA 0.25 mg/m^3: SA:CF_{ψ}/$PAPRHiE_{\psi}$ 0.5 mg/m^3: HiEF/SCBAF/SAF 20 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Blue-gray eyes, nasal septum, throat, skin; irrit skin, ulceration; GI	Eye: Irr immed Skin: Water flush Breath: Art resp Swallow: Medical attention immed	Nasal septum, skin, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 100 mppcf: D 200 moocf: DXSQ/HiE/SA/SCBA 500 mppcf: PAPRD/SA:CF 1000 mppcf; HiEF/SCBAF/SAF/ PAPRTHiE^4/SAF:CF^4 10,000 mppcf: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP: ASCBA Escape: HiEF/SCBAE	Inh Con	Cough, dysp, digital clubbing, cyan, basal crackles, cor pulmonale	Eye: Irr immed Breath: Art resp	Lungs, CVS
Clothing: Any poss Goggles: Reason prob Wash: Immed upon contam Change: After work any poss contam Remove: Immed contam non-imperv Provide: Quick drench	OSHA 0.25 mg/m^3: DMXS 0.5 mg/m^3: DMXSQ/SA/SCBA 1.25 mg/m^3: PAPRDM/SA:CF 2.5 mg/m^3: PAPRTHiE/SAF/SCBAF/HiEF 5 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Vomit; halu; nystagmus; pares; twitch face musc; convuls; pulsus altenans; ectopic heartbeat, tacard; venfib; pulm edema	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CVS, lungs, kidneys, CNS
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: After work it may be contam Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH 50 mg/m^3: $PAPRD_{\psi}$/SA:CF_{ψ} 100 mg/m^3: SCBAF/SAF/HiEF 200 mg/m^3: SAF:PD,RP Ω: SCBAF:PD,PP/ SAF:PD,PP: ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit nose; pneumonitis; burns eyes, skin; temporary loss of hair	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Stibine SbH_3 7803-52-3 WJ0700000 2676 18	Hydrogen antimonide, Antimony trihydride	0.1 ppm (0.5 mg/m³)	40 ppm	Colorless gas with a disagreeable, hydrogen sulfide-like odor	MW: 125 BP: 1°F Sol: 0.1% Fl.P: N.A. IP: 9.58 eV	VP: >1 atm MP: -126°F UEL: ? LEL: ?	Acids, halogenated hydrocarbons, oxidizers, moisture	Ads; HCl; color; Set 2
Stoddard solvent C_9H_{20} 8052-41-3 WJ8925000	Dry cleaning safety solvent, Mineral spirits	500 ppm (2900 mg/m³) (NIOSH) 350 mg/m³ 10-hr TWA (1800 mg/m³) 15-min ceil (ACGIH) 100 ppm (525 mg/m³)	5000 ppm	Colorless liquid with a kerosene-like odor	MW: ≅144 BP: 302 to 329°F Sol: Insoluble Fl.P: 102 to 140°F	VP: ≅2 mm MP: ? UEL: ? LEL: 0.8%	Strong oxidizers	Char; CS_2; GC; III
Strychnine $C_{21}H_{22}N_2O_2$ 57-24-9 WL2275000 1692 53	None	0.15 mg/m³	3 mg/m³	Colorless, odorless solid	MW: 334 BP: Decomposes Sol: 0.02% Not combustible	VP: ≅0 mm MP: 547°F	Strong oxidizers	Filter; ion pair reagent; HPLC; Set 6
Styrene $C_6H_5CHCH_2$ 100-42-5 WL3675000 2055 27	Phenylethylene, Vinylbenzene, Cinnamene, Styrene monomer	100 ppm 200 ppm ceil 600 ppm 5 min/3-hr peak (NIOSH) 50 ppm 10-hr TWA 100 ppm 15-min ceil (ACGIH) 50 ppm	5000 ppm	Colorless liquid with a sweet, aromatic odor at low concentrations; sharp, penetrating, disagreeable odor at higher levels	MW: 104 BP: 293°F Sol: 0.03% Fl.P: 90°F IP: 8.47 eV	VP: 4.5 mm MP: -23°F UEL: 6.1% LEL: 1.1%	Oxidizers, catalysts for vinyl polymers; peroxides, strong acids, aluminum chloride	Char; CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 1.0 ppm: SA/SCBA 2.5 ppm: SA:CF 5 ppm: SCBAF/SAF/SAT:CF 40 ppm: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh	Head, weak; nau, abdom pain; lumbar pain, hemog, hema, hemolytic anemia; jaun; irrit lung	Breath: Art resp	Blood, liver, kidneys, lungs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	NIOSH 3500 mg/m^3: SA[4]/SCBA[4]CCROV[4] 5900 mg/m^3: PAPROV[4]/CCRFOV 14,750 mg/m^3: SA:CF[4] 29,500 mg/m^3: GMFOV/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con Ing	Irrit eyes, nose, throat; dizz; derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, resp sys, CNS
Clothing: Repeat prolong Goggles: N.A. Wash: Promptly upon contam Change: After work any poss contam Remove: N.A.	OSHA 0.75 mg/m^3: DMXS 1.5 mg/m^3: DMXSQ/SA/SCBA 3 mg/m^3: PAPRDM/SA:CF/HiEF/ SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Stiff neck, fasc musc, restless, apprehension, acuity of perception, reflex excitability, cyan, tetanic convuls, opisthotonos	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	NIOSH 500 ppm: CCROV[4]/SA[4]/SCBA[4] 1000 ppm: CCRFOV/PAPROV[4] 1250 ppm: SA:CF[4] 2500 ppm: GMFOV/SAF/SCBAF 5000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose; drow, weak, unsteady gait; narco; defatting derm	Eye: Irr immed Skin: Water flush Breath: Art resp Swallow: Medical attention immed	CNS, resp sys, eyes, skin

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Sulfur dioxide SO_2 7446-09-5 WS4550000 1079 16	None	5 ppm (13 mg/m³) (NIOSH) 0.5 ppm 10-hr TWA (ACGIH) 2 ppm (5 mg/m³)	100 ppm	Colorless liquid or gas with a characteristic, pungent odor; can be liquid at <14°F	MW: 64 BP: 14°F Sol: 10% Not combustible IP: 12.3 eV	VP: >1 atm MP: -104°F	Powdered and alkali metals such as sodium, potassium	NIOSH 79-141
Sulfuric acid H_2SO_4 7664-93-9 WS5600000 1831 39	Oil of vitriol	1 mg/m³ (NIOSH) 1 mg/m³/ 10-hr TWA	80 mg/m³	Colorless to dark brown, oily liquid; odorless	MW: 98 BP: 518°F Sol: Miscible Not combustible, but highly reactive	VP: < 0.001 mm MP: 37°F	Organics: chlorates, carbides, fulminates, picrates, metals	SiO_2; $NaHCO_3$; IC; III
Sulfur monochloride S_2Cl_2 10025-67-9 WS4300000 1828 39	Sulfur chloride, Sulfur subchloride	1 ppm (6 mg/m³)	10 ppm	Amber to red, fuming, oily liquid with a pungent, nauseating, irritating odor	MW: 135 BP: 280°F Sol: Reacts Fl.P: 245°F	VP: 6.8 mm MP: -105°F UEL: ? LEL: ?	Peroxides, oxides of phosphorous, organics; water	—
Sulfur pentafluoride S_2F_{10} 5714-22-7 WS4480000	Disulfur decafluoride	0.025 ppm (0.25 mg/m³)	1 ppm	Colorless liquid or gas with an odor like sulfur dioxide	MW: 254 BP: 84°F Sol: Insoluble Not combustible	VP: 561 mm MP: -67°F	None hazardous	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Prevent skin freezing Goggles: Any poss Wash: N.A. Change: N.A. Remove: Any wet immed Provide: Eyewash	NIOSH 5 ppm: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$/CCRS$^{\blacktriangle}$ 12.5 ppm: SA:CF$^{\blacktriangle}$/PAPRS$^{\blacktriangle}$ 25 ppm: SAF/SCBAF/CCRSF/GMFS 100 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Con	Irrit eyes, nose, throat, rhin; choking, cough; reflex bronchoconstriction; eye, skin burns	Eye: Irr immed Skin: Water flush immed Breath: Art resp	Resp sys, skin, eyes
Clothing: > 1% AP/≤ 1% RP Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: > 1% Eyewash, quick drench	NIOSH 25 mg/m^3: PAPRHiEAG$^{\blacktriangledown}$/SA:CF$^{\blacktriangledown}$ 50 mg/m^3: CCRAGFHiE/SCBAF/SAF/ GMFAGHiE 80 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEAG/SCBAE	Inh Ing Con	Eye, nose, throat irrit; pulm edema, bron emphysema; conj; stomatitis; dent erosion; trachbronc; skin, eye, burns; derm	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin, teeth
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 10 ppm: PAPRS$^{\blacktriangledown}$/CCRSF/ GMFS/SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Con Ing	Lac; cough; burn eyes, skin; pulm edema	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Any poss Goggles: Any poss Wash: N.A. Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 0.25 ppm: SA/SCBA 0.625 ppm: SA:CF 1 ppm: SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFAG/SCBAE	Ing Con	In animals: breath difficulties	Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, CNS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Sulfuryl fluoride SO_2F_2 2699-79-8 WT5075000 2191 15	None	5 ppm (20 mg/m^3)	1000 ppm	Colorless, odorless gas	MW: 102 BP: -67°F Sol: 0.16% Not combustible IP: 13.3 eV	VP: > 1 atm MP: -213°F	None hazardous	—
2,4,5-T $Cl_3C_6H_2OCH_2COOH$ 93-76-5 AJ8400000 2765 55	2,4,5-Trichlorophenoxyacetic acid	10 mg/m^3	5000 mg/m^3	Colorless to tan, odorless solid	MW: 256 BP: Decomposes Sol: 0.03% Not combustible	VP: ≅0 mm MP: 316°F	None hazardous	Filter; CH_3OH; HPLC; III
Talc (non-asbestiform) 14807-96-6 VV7720000	Hydrous magnesium silicate, Steatite talc, Non-fibrous talc, Non-asbestiform talc	20 mppcf (ACGIH) 2 mg/m^3 (resp dust)	N.A.	Odorless solid	MW: ≅ 295 BP: N.A. Sol: Insoluble Not combustible	VP: ≅0 mm MP: 1652 to 1832	None hazardous	—
Tantalum metal, oxide dusts (as Ta) Ta 7440-25-7 WW5505000	Synonyms vary depending upon specific compound	5 mg/m^3	N.A.	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Strong oxidizers	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 50 ppm: SA[4]/SCBA[4] 125 ppm: SA:CF[4] 250 ppm: SCBAF/SAF 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Con	Conj, rhin, phar, pares	Eye: Irr immed Breath: Art resp	Resp sys, CNS
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 50 mg/m^3: DMXS 100 mg/m^3: DMXSQ/SA/SCBA 250 mg/m^3: SA:CF/PAPRDM 500 mg/m^3: HiEF/SAF/ PAPRTHiE/SCBAF/SAT:CF 5000 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Animal studies: ataxia, skin irrit, acne-like rash, blood in stool	Eye: Irr immed Skin: Soap wash Breath: Art resp Swallow: Medical attention immed	Skin, liver, GI tract
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	ACGIH 10 mg/m^3: DM 20 mg/m^3: DMXSQ/SA/SCBA 50 mg/m^3: PAPRDM/SA:CF 100 mg/m^3: HiEF/PAPRTHiE/ SCBAF/SAF/SAT:CF 2000 mg/m^3: SA:PD,PP 4000 mg/m^3: SAT:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con	Fibrotic pneumoconiosis	Eye: Irr immed	Lungs, CVS
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 25 mg/m^3: DM[4] 50 mg/m^3: DMXSQ[4]/DMFu/SA/SCBA 125 mg/m^3: PAPRDM[4]/SA:CF 250 mg/m^3: HiEF/PAPRTHiE/SCBAF/SAF/SAT:CF 5000 mg/m^3: SA:PD,PP 10,000 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh	None known in humans	Breath: Art resp	None known in humans

Tantalum metal, oxide dusts

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties	Incompatibilities	Measurement Method (See Tables 1a and 1b)
TEDP $(C_2H_5)_4P_2S_2O_5$ 3689-24-5 XN4375000 1704 55	Tetraethyl pyrophosphorodithionate, Sulfotep, Tetraethyl dithiono-pyrophosphate, Tetraethyl dithiopyrophosphate	0.2 mg/m³	35 mg/m³	Yellow liquid with a garlic odor	MW: 322 BP: Decomposes Sol: 0.0025% Not combustible VP: Very low MP: ?	Strong oxidizers	Ads(2); toluene; GC; III
Tellurium compounds (as Te) Te 13494-80-9 WY2625000	Synonyms vary depending upon specific compound	0.1 mg/m³	N.A.	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound	Hazards vary depending upon specific compound	Filter; acid; AA; N
Tellurium hexafluoride (as Te) TeF_6 7783-80-4 WY2800000 2195 15	None	0.02 ppm (0.2 mg/m³)	1 ppm	Colorless gas with a repulsive odor	MW: 242 BP: -38°F Sublimes Sol: Reacts slowly Not combustible VP: >1 atm MP: -36°F (triple point)	None hazardous	Char; NaOH; AA; M
TEPP $(C_2H_5)_4P_2O_7$ 107-49-3 UX6825000 2784 57	Tetraethyl pyrophosphate, Commercial 40%, Ethyl pyrophosphate, Bladan, Nifost, Vapotone, Tetron, Killax, Moropal	0.05 mg/m³	10 mg/m³	Colorless to amber liquid with a faint, fruity odor	MW: 290 BP: Decomposes Sol: Miscible Not combustible VP(284°F): 1 mm MP: 32°F	Strong oxidizers	—

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 2 mg/m^3: SA/SCBA 5 mg/m^3: SA:CF 10 mg/m^3: SAF/SCBAF 35 mg/m^3: SA:PD,PP §: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Eye pain, vision, tears, head, cyan, anor, nau, vomit, diarr, local sweat, weak, twitch, paralysis, Cheyne-Stokes resp, convul, low BP, cardiac	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, resp sys, CVS
Recommendations vary depending upon specific compound	OSHA 0.5 mg/m^3: DMXS[*] 1 mg/m^3: SA/SCBA/DMXSQ[*]/DMFu 2.5 mg/m^3: PAPRDM[*]SA:CF 5 mg/m^3: PAPRTHIE/SCBAF/SAT:CF/HiEF 50 mg/m^3: SA:PD,PP §: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HIEF/SCBAE	Inh Abs Ing Con	Garlic odor on breath, sweat; dry mouth, metal taste; somnolence; anor, nau; no sweat; derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, CNS
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 0.2 ppm: SA/SCBA 0.5 ppm: SA:CF 1 ppm: SCBAF/SAF/SAT:CF §: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh	Head, dysp, garlic odor on breath	Breath: Art resp	Resp sys
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	0.05 mg/m^3: SA/SCBA 1.25 mg/m^3: SA:CF 2.5 mg/m^3: SAF/SCBAF/SAT:CF 10 mg/m^3: SA:PD,PP §: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Eye pain, vision, tears, head, chest, cyan, anor, nau, vomit, diarr, local sweat, weak, twitch, paralysis, Cheyne-Stokes resp, convul, low BP, cardiac	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, resp sys, CVS, GI tract

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Terphenyls $C_{18}H_{14}$ 92-94-4 WZ6475000	Triphenyls, ortho-Terphenyl, meta-Terphenyl, para-Terphenyl, Mixed terphenyls, Diphenyl benzenes	1 ppm ceil (9 mg/m³) (ACGIH) 0.5 ppm ceil (5 mg/m³)	3500 mg/m³	Colorless or light-yellow solid	MW: 230 BP: 630 to 718°F Sol: Insoluble Fl.P(oc): 325 to 405°F	VP: Very low MP: 133 to 415°F UEL: ? LEL: ?	None hazardous	Filter; CS_2; GC; C
1,1,2,2-Tetrachloro-1,2-difluoroethane $CCl_2F\text{-}CCl_2F$ 76-12-0 KI1420000 1078 12	Refrigerant 112, Halocarbon 112, Freon 112	500 ppm (4170 mg/m³)	15,000 ppm	Colorless liquid or solid with a slight ether-like odor	MW: 204 BP: 199°F Sol: 0.01% Not combustible	VP: 40 mm MP: 79°F	Chemically active metals: sodium, potassium, beryllium, powdered aluminum, zinc, magesium	Char; CS_2; GC; I
1,1,1,2-Tetrachloro-2,2-difluoroethane $CCl_3F\text{-}CClF_2$ 76-11-9 KI1425000 1078 12	Refrigerant 112a; Halocarbon 112a; 2,2-Difluoro-1,1,1,2-Tetrachloroethane; Freon 112a	500 ppm (4170 mg/m³)	15,000 ppm	Colorless liquid or solid with a slight ether-like odor	MW: 204 BP: 197°F Sol: 0.01% Not combustible	VP: 40 mm MP: 105°F	Chemically active metals: sodium, potassium, beryllium, powdered aluminum, zinc, magnesium	Char; CS_2; GC; I
1,1,2,2-Tetrachloroethane $CHCl_2CHCl_2$ 79-34-5 KI8575000 1702 55	Symmetrical tetrachloroethane, Acetylene tetrachloride, sym-tetrachloroethane	5 ppm (35 mg/m³) (NIOSH) Lowest detectable limit (ACGIH) 1 ppm (7 mg/m³)	150 ppm Ca	Colorless to pale yellow liquid with a sickly sweet odor like chloroform	MW: 168 BP: 295°F Sol: 0.29% Not combustible IP: 11.1 eV	VP: 8 mm MP: -45°F	Chemically active metals: strong caustics; hot iron, aluminum, zinc in presence of steam	Char; CS_2; GC; I

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: AP molten/RP liq-sol Goggles: AP molten/reas prob liq-sol Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv Provide: Eyewash, quick drench	ACGIH 125 mg/m^3: PAPRDM*/SA:CF* 250 mg/m^3: SCBAF:SAF/HIEF 3500 mg/m^3: SAF:PD,PP Q: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHIE/SCBAE	Inh Ing Con	Irrit eyes, skin, thermal burns	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Skin, resp sys, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	OSHA 5000 ppm: SA/SCBA 12,500 ppm: SA:CF 15,000 ppm: SCBAF/SAF Q: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit skin, conj, pulm edema	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Lungs, skin
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	OSHA 5000 ppm: SA/SCBA 12,500 ppm: SA:CF 15,000 ppm: SCBAF/SAF Q: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	CNS depres, pulm edema, skin irrit, eye irrit, drowsy, dysp	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH Y: SAF:PP,PP: ASCBA/SCBAF:PD,PP Escape: GMFOV/SCBAE	Inh Abs Ing Con	Nau, vomit, abdom pain, tremor fingers, jaun, enl tend liver, derm, monocy, kidney damage, pares	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Liver, kidneys, CNS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Tetrachloroethylene CCl_2CCl_2 127-18-4 KX3850000 1897 74	Perchloroethylene, Perchlorethylene, Tetrachlorethylene, Perk	100 ppm 200 ppm ceil 300 ppm/ 5 min/3-hr peak (NIOSH) lowest feasible limit See Appendix A (ACGIH) 50 ppm	500 ppm Ca	Colorless liquid with an odor like ether or chloroform	MW: 166 BP: 250°F Sol: 0.015% Not combustible IP: 9.32 eV	VP: 14 mm MP: -8°F	Strong oxidizers, chemically active metals, such as barium, lithium, beryllium	Char; CS_2; GC; J
Tetrachloronaphthalene $C_{10}H_4Cl_4$ 1335-88-2 QK3700000	Halowax, Seekay wax, Nibren wax	2 mg/m³	20 mg/m³	Colorless to pale yellow solid with an aromatic odor	MW: 266 BP: 600 to 680°F Sol: Insoluble Fl.P(oc): 410°F	VP: <1 mm MP: 239°F UEL: ? LEL: ?	Strong oxidizers	Filter/bub; iso-octane; GC; I
Tetraethyl lead (as Pb) $Pb(C_2H_5)_4$ 78-00-2 TP4550000 1649 56	TEL, Lead tetraethyl, Motor fuel anti-knock compound	0.075 mg/m³ (ACGIH) 0.1 mg/m³	40 mg/m³	Colorless liquid or dyed red, orange, or blue with a slight musty odor	MW: 323 BP: 212°F Sol: Insoluble Fl.P: 200°F IP: 11.1 eV	VP: 0.2 mm MP: -216 to -202°F UEL: ? LEL: ?	Strong oxidizers, sulfuryl chloride, potassium permanganate	Ads; pentane; GC; Set 3
Tetrahydrofuran C_4H_8O 109-99-9 LU5950000 2056 26	Diethylene oxide, Tetramethylene oxide, THF	200 ppm (590 mg/m³)	20,000 ppm	Colorless liquid with an ether-like odor	MW: 72 BP: 151°F Sol: Miscible Fl.P: 6°F	VP: 145 mm MP: -163°F UEL: 11.8% LEL: 2%	Strong oxidizers	Char; CS_2; GC; F

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; nau; flush face, neck; vertigo, dizz, inco; head; som; eryt; [carc]	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Liver, kidneys, eyes, upper resp sys, CNS
Clothing: AP molt or Fu/RP sol or liq Goggles: AP molt/RP sol or liq Wash: Promptly upon contam Change: May be contam solid Remove: Immed contam non-imperv molt/promptly solid	OSHA 20 mg/m^3: SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHIEOV/SCBAE	Inh Abs Ing Con	Acneform derm, head, ftg, anor, verti, jaun, liver injury	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Liver, skin
Clothing: Any poss (>0.1%) Goggles: Reason poss Wash: N.A. Change: After work AP contam (>0.1%) Remove: Imm contam non-imperv (>0.1%) Provide: Quick drench (>0.1%)	OSHA 0.75 mg/m^3: SA/SCBA 1.875 mg/m^3: SA:CF 3.75 mg/m^3: SCBAF/SAFSAT:CF 40 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Insom, lass, anxiety tremor, hyperreflexia, spastic, bradycard, hypotension, hypotherm, pallor, nau, anor, low-wtg, halu, convuls, coma, eye irrit	Eye: Irr immed Skin: Petro product rinse Breath: Art resp Swallow: Medical attention immed	CNS, CVS, kidneys, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: PAPROV•/CCROV 5000 ppm: SA:CF• 10,000 ppm: GMFOV/SCBAF/SAF 20,000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con Ing	Irrit eyes, upper resp; nau; dizz; head	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys, CNS

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties	Incompatibilities	Measurement Method (See Tables 1a and 1b)
Tetramethyl lead (as Pb) $Pb(CH_3)_4$ 75-74-1 TP4725000 1649 56	TML, Lead tetramethyl, Motor fuel anti-knock compound	0.075 mg/m³ (ACGIH) 0.15 mg/m³	40 mg/m³	Colorless liquid or dyed red, orange, or blue with a slight musty odor	MW: 267 BP: 230°F Sol: Insoluble Fl.P: 100°F IP: 9.3 eV VP: 22 mm MP: -22°F UEL: ? LEL: ?	Strong oxidizers, such as sulfuryl chloride or potassium permanganate	—
Tetramethyl succinonitrile $(CH_3)_2C(CN)C(CN)(CH_3)_2$ 3333-52-6 WN4025000	TMSN	0.5 ppm (3 mg/m³) (NIOSH) 1 ppm (6 mg/m³) 15-min ceil	5 ppm	Colorless, odorless solid	MW: 136 BP: Sublimes Sol: Insoluble Fl.P: ? VP: ? MP: 338°F UEL: ? LEL: ?	Strong oxidizers	Char; CS_2; GC; K
Tetranitromethane $C(NO_2)_4$ 509-14-8 PB4025000 1510 47	Tetan	1 ppm (8 mg/m³)	5 ppm	Colorless to pale yellow liquid or solid with a pungent odor; causes tears	MW: 196 BP: 259°F Sol: Insoluble Not combustible VP: 8.4 mm MP: 57°F	Hydrocarbons, alkalies, metals	Imp: ethyl acetate; GC; Q
Tetryl $(NO_2)_3C_6H_2N(NO_2)CH_3$ 479-45-8 BY6300000	2,4,6-Trinitrophenylmethylnitramine; N-Methyl-N-2,4,6-tetranitroaniline; Nitramine; Tetralite	1.5 mg/m³	N.A.	Colorless to yellow, odorless solid	MW: 287 BP: 369°F Sol: 0.02% Fl.P: Explodes VP: <<1 mm MP: 264°F E.T.: 495°F	Oxidizable materials	Filter; DEEA; color; Q

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss (>1.06%) Goggles: Reason prob Wash: N.A. Change: N.A. Remove: Immed contam non-imperv >1.06% Provide: Quick drench (>1.06%)	OSHA 0.75 mg/m³: SA/SCBA 1.875 mg/m³: SA:CF 3.75 mg/m³: SCBAF/SAF/SAT:CF 40 mg/m³: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Insom, bad dreams, restless, anxious; hypotension; nau, anor, delirium; mania, convuls; coma	Eye: Irr immed Skin: Petro product rinse Breath: Art resp Swallow: Medical attention immed	CNS, CVS, kidneys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 5 ppm: SA/SCBA Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Head, nau; convuls, coma	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	CNS
Clothing: Reason prob Goggles: Any poss Wash: Promptly upon contam Change: After work it may be contam Remove: Any wet immed (flamm) Provide: Eyewash	OSHA 5 ppm: SA:CF$^{\bullet}$/PAPRS$^{\bullet\pounds}$/CCRSF$^{\pounds}$/ GMFS/SCBAF/SAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS$^{\pounds}$/SCBAE	Inh Ing Con	Irrit eyes, nose, throat; dizz, head; chest pain, dysp; methhemog, cyan; skin burns	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin, blood, CNS
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam/daily Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 7.5 mg/m³: DMXS 15 mg/m³: DMXSQ‡/SA‡/SCBA‡ 37.5 mg/m³: PAPRDM‡SA:CF‡ 75 mg/m³: HiEF/SCBAF/SAF 3000 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP: ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Sens derm, itch, eryt, edema on nasal folds, cheeks, neck; kera; epis; irido-cyclitis; sneez; cough, coryza; irrit, ftg, mal, head, lass, insom, nau, vomit; anemia	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, CNS, skin; in animals: liver, kidneys

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Thallium, soluble compounds (as Tl) Tl 7440-28-0 XG34250000 1707 53	Synonyms vary depending upon specific compound	0.1 mg/m³	20 mg/m³	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		None hazardous	Filter; acid; AA; U
Thiram $C_6H_{12}N_2S_4$ 137-26-8 JO1400000 2771 55	Tetramethylthiuram disulfide	5 mg/m³	1500 mg/m³	Colorless to cream solid (some commercial products dyed blue)	MW: 240 BP: Decomposes Sol: Insoluble Fl.P: 192°F	VP: ≅0 mm MP: 284°F MEC: ?	Strong oxidizers and acids, oxidizable materials	Filter; CH_3CN; HPLC; III
Tin, inorganic compounds except oxides (as Sn) Sn 7440-31-5 XP7320000	Synonyms vary depending upon specific compound	2 mg/m³	400 mg/m³	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Chlorine, turpentine; for stannic chloride: water, alcohols, amines	Filter; AA; N
Tin, organic compounds (as Sn) Sn 7440-31-5 XP7320000	Synonyms vary depending upon specific compound	0.1 mg/m³ (NIOSH) 0.1 mg/m³ 10-hr TWA	200 mg/m³	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Strong oxidizers	NIOSH 77-157A

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly upon contam	OSHA 0.5 mg/m^3: DMXS[a] 1 mg/m^3: DMXSQ[a]/SA/SCBA 2.5 mg/m^3: PAPRDM[a]/SA:CF 5 mg/m^3: HiEF/SAF/SCBAF /PAPRTHiE/SAT:CF 20 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Nau, diarr, abdom pain; ptosis, strabismus; peri neurit tremor; pares legs, retster chest pain, pulm edema; sez chor psypec	Eye: Irr immed Skin: Water flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, CNS, lung, liver, kidneys, GI tract, body hair
Clothing: Reason prob Goggles: Reason prob Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv	OSHA 50 mg/m^3: CCROVDMFu[a]/ SA[a]/SCBA[a] 125 mg/m^3: PAPROVDMFu[a]/SA:CF[a] 250 mg/m^3: SCBAF/CCRFOVHiE/SAF PAPRTOVHiE[a]/GMFHiEOV 1500 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOVHiE/SCBAE	Inh Ing Con	Irrit muc memb; derm; with ethanol consumption: flush, eryt, pruritis, urticaria, head, nau, vomit, diarr, weak, dizz, diff breath	Eye: Irr immed Skin: Soap wash promptly Swallow: Medical attention immed	Resp sys, skin
Recommendations vary depending upon specific compound	OSHA 10 mg/m^3: DMXS[a] 20 mg/m^3: DMXSQ[a][a]/SA[a]/SCBA[a] 50 mg/m^3: PAPRDM[a][a]/SA:CF 100 mg/m^3: HiEF/SCBAF/SAF 400 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con	Irrit eyes, skin	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Recommendations vary depending upon specific compound	NIOSH 1 mg/m^3: CCROVDM/SA/SCBA 2.5 mg/m^3: SA:CF/PAPROVDM 5 mg/m^3: CCRFOVHiE/SAF/SCBAF GMHiEOV/PAPRTOVHiE/SAT:CF 200 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOVHiE/SCBAE	Inh Abs Ing Con	Head, vert; irrit eyes; psycho neuro dist; sore throat, cough; abdom pain, vomit, urine retention; paresis; skin burn, pruritis	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	CNS, eyes, liver, urinary tract, skin, blood

Tin, organic compounds (as Sn)

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Titanium dioxide TiO_2 13463-67-7 XR2275000 2546 37	Rutile, Anatase, Brookite	15 mg/m³ (ACGIH) 10 mg/m³ (total dust <1% quartz) 5 mg/m³ (resp dust)	N.A.	White powder, odorless	MW: 80 BP: <5432°F Sol: Insoluble Not combustible	VP: ≅0 mm MP: 2984°F	None hazardous	Filter; acid; AA; O
Toluene $C_6H_5CH_3$ 108-88-3 XS5250000 1294 27	Toluol, Phenyl methane, Methyl benzene	200 ppm 300 ppm ceil 500 ppm 10-min peak (NIOSH) 100 ppm 10-hr TWA 200 ppm 10-min ceil (ACGIH) 100 ppm	2000 ppm	Colorless liquid with an aromatic odor like benzene	MW: 92 BP: 231°F Sol: 0.05% Fl.P: 40°F IP: 8.82 eV	VP: 22 mm MP: -139°F UEL: 7.1% LEL: 1.3%	Strong oxidizers	Char; CS_2; GC; V
Toluene-2, 4-diisocyanate $CH_3C_6H_3(NCO)_2$ 584-84-9 CZ6300000 2078 57	TDI; 2,4-Toluene diisocyanate	0.02 ppm ceil (0.14 mg/m³) (NIOSH) 35 µg/m³ 10-hr TWA 140 µg/m³ 10-min ceil (ACGIH) 0.005 ppm	10 ppm	Colorless, yellow, or dark liquid or solid with a sweet, fruity, pungent odor	MW: 174 BP: 484°F Sol: Rx, slow Fl.P: 270°F	VP: ≅0.04 mm MP: 71°F UEL: 9.5% LEL: 0.9%	Strong oxidizers, water, acids, bases, amines, etc., cause foam and spatter	Imp/reagent; acetic anhydride; HPLC; III
o-Toluidine $CH_3C_6H_4NH_2$ 95-53-4 XU2975000 1708 55	ortho-Aminotoluene; o-Methylaniline; 1-Methyl-1,2-amino-benzene; 2-Methylaniline	5 ppm (22 mg/m³) (ACGIH) 2 ppm, A2 (9 mg/m³, A2)	100 ppm	Colorless to pale yellow liquid with a weak, aromatic odor	MW: 107 BP: 391°F Sol: 1.5% Fl.P: 185°F IP: 7.6 eV	VP: <1 mm MP: -3°F UEL: ? LEL: 1.5%	Strong oxidizers	SiO_2; CH_3CH_2OH; GC; L

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards Route	Health Hazards Symptoms (See Table 4)	Health Hazards First Aid (See Table 5)	Health Hazards Target Organs
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	ACGIH 50 mg/m^3: DM$^{\prime}$ 100 mg/m^3: DMXSQ$^{\prime}$/SA/SCBA 250 mg/m^3: PAPRDM$^{\prime}$/SA:CF 500 mg/m^3: HiEF/PAPRTHIE/SCBAF/SAF/SAT:CF 7500 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh	Slight lung fibrosis	Breath: Art resp	Lungs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Any wet immed (flamm)	NIOSH 1000 ppm: CCROV$^{\Delta}$/SA$^{\Delta}$ PAPROV$^{\Delta}$/SCBA$^{\Delta}$ 2000 ppm: SA:CF$^{\Delta}$SCBAF/SAF/GMFOV Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Ftg, weak; conf, euph, dizz; head; dil pup, lac; ner; musc ftg; insom; pares; derm; photo	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	CNS, liver, kidneys, skin
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv Provide: Eyewash, quick drench	NIOSH 0.05 ppm: SA$^{\Delta}$/SCBA$^{\Delta}$ 0.125 ppm: SA:CF$^{\Delta}$ 1 ppm: SCBAF/SAF 10 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit nose, throat; choke, parox cough; retster pain; nau, abdom pain; bron spas, pulm edema; asth; conj; derm	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, skin
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Anoxia, head, cyan, weak, dizz, drow, micro hematuria, eye burns, derm	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Blood, kidneys, liver, CVS, skin, eyes

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Tributyl phosphate $(C_4H_9O)_3PO$ 126-73-8 TC7700000	Tri-n-butyl phosphate, TBP	5 mg/m³ (ACGIH) 0.2 ppm (2.5 mg/m³)	1300 mg/m³	Colorless to pale yellow, odorless liquid	MW: 266 BP: 560 °F Sol: 0.1% Fl.P: 330 °F	VP: Very low MP: -112 °F UEL: ? LEL: ?	None hazardous	Filter; ether; GC; P
1,1,2-Trichloroethane $CHCl_2CH_2Cl$ 79-00-5 KJ3150000 2831 74	Vinyl trichloride, beta-Trichloroethane	10 ppm (45 mg/m³) (NIOSH)	500 ppm Ca	Colorless liquid with a sweet odor like chloroform	MW: 133 BP: 236 °F Sol: 0.5% Fl.P: None	VP: 19 mm MP: -34 °F UEL: 15.5% LEL: 6%	Strong oxidizers and caustics, chemically active metals, such as aluminum, magnesium powders, sodium, potassium	Char; CS_2; GC; J
Trichloroethylene $CHClCCl_2$ 79-01-6 KX4550000 1710 74	Ethylene trichloride, Triclene	100 ppm 200 ppm ceil 300 ppm peak (NIOSH) 25 ppm 10-hr TWA See Appendix A (ACGIH) 50 ppm	1000 ppm Ca	Colorless liquid, unless dyed, with a sweet odor like chloroform	MW: 131 BP: 188 °F Sol: 0.1% Fl.P: None IP: 9.47 eV	VP: 58 mm MP: -123 °F UEL: 41% LEL: 11%	Strong caustics; when acidic reacts with aluminum; chemically active metals; barium, lithium, sodium, magnesium, titanium	Char; CS_2; GC; J
Trichloronaphthalene $C_{10}H_5Cl_3$ 1321-65-9 QK4025000	Halowax, Seekay wax, Nibren wax	5 mg/m³	50 mg/m³	Colorless to pale yellow solid with an aromatic odor	MW: 231 BP: 580 to 670 °F Sol: Insoluble Fl.P(oc): 392 °F	VP: < 1 mm MP: 199 °F UEL: ? LEL: ?	Strong oxidizers	Filter/bub; iso-octane; GC; I

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table [illegible])	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	ACGIH 25 mg/m³: SA/SCBA/CCROVDM 62.5 mg/m³: SA:CF 125 mg/m³: SAF/SCBAF/CCRFOVHiE/GMFOVHiE/PAPRTOVHiE 1300 mg/m³: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Con Ing	Eyes, resp, skin irrit; head; nau	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit nose, eyes; CNS depression; liver, kidney damage	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	CNS, eyes, nose, liver, kidneys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Head, vertigo, vis dist, tremors, somnolence, nau, vomit, irrit eyes, derm; card arrhy; pares; [carc]	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, heart, liver, kidneys, CNS, skin
Clothing: AP molten fu/RP sol liq Goggles: AP molten/Reas sol liq Wash: Promptly upon contam Change: After work it may be contam sol Remove: Immed contam non-imperv molten/pro contam sol	OSHA 50 mg/m³: SAF/SCBAF/SA:CFψ Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Acneform derm, anor, nau, vert, jaun, liver injury	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, liver

Trichloronaphthalene

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
1,2,3-Trichloropropane $CH_2ClCHClCH_2Cl$ 96-18-4 TZ9275000	Allyl trichloride, Glyceroltrichlorohydrin, Glycerin trichlorohydrin, Trichlorohydrin	50 ppm (300 mg/m^3)	1000 ppm	Colorless liquid with a strong, acid odor	MW: 147 BP: 313°F Sol: Insoluble Fl.P: 164°F	VP: 3.4 mm MP: 5°F UEL: 12.6% LEL: 3.2%	Active metals, strong caustics and oxidizers	Char; CS_2; GC; I
1,1,2-Trichloro-1,2,2-trifluoroethane CCl_2FCClF_2 76-13-1 KJ4000000 1078 12	Halocarbon 113, Refrigerant 113, TTE, Freon 113	1000 ppm (7600 mg/m^3)	4500 ppm	Colorless liquid with an odor like carbon tetrachloride (at high concentrations)	MW: 187 BP: 118°F Sol: 0.02% Not combustible IP: 11.99 eV	VP: 284 mm MP: -31°F	Chemically active metals: calcium, powdered aluminum, zinc, magnesium, beryllium; contact alloys >2% Mg decomposes	Char; CS_2; GC; I
Triethylamine $(C_2H_5)_3N$ 121-44-8 YE0175000 1296 68	None	25 ppm (100 mg/m^3) (ACGIH) 10 ppm (40 mg/m^3)	1000 ppm	Colorless liquid with a fishy odor	MW: 101 BP: 193°F Sol: 5.5% Fl.P(oc): 20°F IP: 7.5 eV	VP: 54 mm MP: -175°F UEL: 8% LEL: 1.2%	Strong oxidizers and acids	Bub; H_2SO_4; GC; K
Trifluoromonobromomethane $CBrF_3$ 75-63-8 PA5425000 1009 12	Halon 1301, Halocarbon 13B^1, Refrigerant 13B1, Bromotrifluoromethane, Freon 13B1	1000 ppm (6100 mg/m^3)	50,000 ppm	Colorless gas with a slight, ethereal odor	MW: 149 BP: -72°F Sol: 0.03% Not combustible IP: 11.9 eV	MP: -270°F	Chemically active metals, calcium, powdered aluminum, zinc, magnesium	Char; CH_2Cl_2; GC; I

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	OSHA 500 ppm: SA*/SCBA* 1000 ppm: SAF/SCBAF/SA:CF* Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, throat; CNS depres; liver injury; skin irrit	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Eyes, resp sys, skin, CNS liver
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon wet Change: N.A. Remove: Promptly wet non-imperv	OSHA 4500 ppm: SA/SCBA Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit throat, drow, derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, heart
Clothing: Repeat prolong Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Any wet immed (flamm) Provide: >1% eyewash, quick drench	ACGIH 250 ppm: SA:CF* 500 ppm: SCBAF/SAF 1000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Abs Con	Irrit eyes, resp sys, skin	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Resp sys, eyes, skin
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 10,000 ppm: SA/SCBA 25,000 ppm: SA:CF 50,000 ppm: SCBAF/SAF/SAT:CF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con	Li-head, card arrhy	Breath: Art resp	Heart, CNS

Trifluoromonobromomethane

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Trinitrotoluene $CH_3C_6H_2(NO_2)_3$ 118-96-7 XU0175000 1356 33	TNT; Trinitrotoluol; 2,4,6-Trinitrotoluene; sym-Trinitrotoluene	1.5 mg/m³ (ACGIH) 0.5 mg/m³	N.A.	Colorless to pale yellow, odorless solid	MW: 227 BP: 464 °F Sol: 0.013% Fl.P: Explodes	VP(185 °F): 0.05 mm MP: 178 °F E.T.: 887 °F LEL: ?	Strong oxidizers, ammonia, strong alkalies, oxidizable materials	—
Triorthocresyl phosphate $(CH_3C_6H_4O)_3PO$ 78-30-8 TD0350000 2574 55	o-Tritolyl phosphate, TCP, TOCP	0.1 mg/m³	40 mg/m³	Colorless, odorless liquid	MW: 368 BP: Decomposes Sol: 0.00003% Fl.P: 437 °F	VP: Very low MP: -27 °F UEL: ? LEL: ?	None hazardous	Filter; ether; GC; P
Triphenyl phosphate $(C_6H_5O)_3PO$ 115-86-6 TC8400000	Phenyl phosphate, TPP	3 mg/m³	N.A.	Colorless solid with a faint, aromatic odor	MW: 326 BP: 698 °F Sol: 0.001% Fl.P: 428 °F	VP: Very low MP: 119 °F UEL: ? LEL: ?	None hazardous	Filter; ether; GC; P
Turpentine $C_{10}H_{16}$ 8006-64-2 YO8400000 1299 27	Gumspirits, Turps, Wood turpentine, Spirits of turpentine, Sulfate wood turpentine, Steam distilled turpentine, Gum turpentine	100 ppm (560 mg/m³)	1900 ppm	Colorless liquid with a characteristic paint odor	MW: ≅136 BP: 302 to 356 °F Sol: Insoluble Fl.P: 95 °F	VP: 5 mm MP: -58 to -76 °F UEl: ? LEL: 0.8%	Strong oxidizers, chlorine	Char; CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam/daily Change: After work it may be contam Remove: Promptly contam non-imperv	ACGIH 5.0 mg/m^3: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$ 12.5 mg/m^3: SA:CF$^{\blacktriangle}$ 25 mg/m^3: SAF/SCBAF 1000 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Ing Con	Liver damage; jaun; cyan; sneez; cough, sore throat; peri neur, musc pain; kidney damage; card; cataract; derm; leucyt, anemia	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Blood, liver, eyes, CVS, CNS, kidneys, skin
Clothing: Repeat prolong Goggles: N.A. Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	OSHA 0.5 mg/m^3: DMXS 1 mg/m^3: DMXSQ/SA/SCBA 2.5 mg/m^3: PAPRDM/SA:CF 5 mg/m^3: HiEF/PAPRTHiE/SCBAF/ SAF/SAT:CF 40 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	GI; peripheral neuropathy; cramps in calves; pores in feet or hands; weak, bilat, foot or wrist drop, para	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	PNS, CNS
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 15 mg/m^3: DXS 30 mg/m^3: DXSQ/SA/SCBA/HiE 75 mg/m^3: PAPRDM/SA:CF 150 mg/m^3: HIEF/PAPRTHiE/SCBAF/ SAF/SAT:CF 1500 mg/m^3: SA:PD,PP 3000 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing	Minor changes in blood enzymes; in animals: musc weakness, paralysis	Breath: Art resp Swallow: Medical attention immed	Blood
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	OSHA 1000 ppm: CCRFOV/PAPROV$^{\blacktriangledown}$ 1900 ppm: SA:CF$^{\blacktriangledown}$/GMFOV/ SAF/SCBAF Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat; head, vertigo; hematuria, albuminuria; skin irrit, sens	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, eyes, kidneys, resp sys

Turpentine

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties	Incompatibilities	Measurement Method (See Tables 1a and 1b)
Uranium, insoluble compounds (as U) U 7440-61-1 YR3490000 9175 65	Synonyms vary depending upon specific compound	0.25 mg/m³ (ACGIH) 0.2 mg/m³	30 mg/m³	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound	Uranium: CO_2, CCl_4, HNO_3, Uranium hydride: strong oxidizers; H_2O, halogenated hydrocarbons	—
Uranium, soluble compounds (as U) U 7440-61-1 YR3590000	Synonyms vary depending upon specific compound	0.05 mg/m³ (ACGIH) 0.2 mg/m³	20 mg/m³	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound	Uranyl nitrates: combustibles, Uranium hexafluoride: water	—
Vanadium pentoxide dust (as V) V_2O_5 1314-62-1 YW2450000 2862 55	None	0.5 mg/m³ ceil (NIOSH) 0.05 mg/m³ 15-min ceil	70 mg/m³	Yellow-orange powder or dark gray flakes, odorless	MW: 182 BP: 3182°F Sol: 0.1% Not combustible VP: ≅0 mm MP: 1274°F	None hazardous	Filter; NaOH; AA; Set 1
Vanadium pentoxide fume (as V) V_2O_5 1314-62-1 YW2460000 2862 55	None	0.1 mg/m³ ceil (NIOSH) 0.05 mg/m³ 15-ceil (ACGIH) 0.05 mg/m³	70 mg/m³	Finely divided particulate dispersed in air	MW: 182 BP: 3182°F Sol: 0.1% Not combustible VP: ≅0 mm MP: 1274°F	None hazardous	Filter; NaOH; AA; Set 2

		Health Hazards			
Personal Protection and Sanitation (See Table 2)	**Respirator Selection Upper Limit Devices Recommended (See Table 3)**	**Route**	**Symptoms (See Table 4)**	**First Aid (See Table 5)**	**Target Organs**
Clothing: Repeat prolong Goggles: Any poss Wash: Promptly upon contam Change: After work it may be contam Remove: Promptly contam non-imperv Provide: Eyewash	ACGIH 2.0 mg/m^3: DMFu^4/SA^4/SCBA^4 5 mg/m^3: SA:CF^4/PAPRDMFu^4 10 mg/m^3: HiEF/SCBAF/SAF/PAPRTHiE^4 30 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con Ing	Derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Skin, bone marrow, lymphatics
Clothing: RP/AP UF_6 Goggles: Any poss Wash: Promptly contam/immed & daily UF_6 Change: After work may contam/UF_6 AP Remove: Non-imperv promptly/immed UF_6 Provide: Eyewash (UF_4), quick drench	See Appendix B	Inh Con Ing	Lac, conj; short breath, cough, chest rales; nau, vomit; skin burns; RBC, casts in urine, album, high BUN	Eye: Irr immed Skin: Water flush immed Breath: Art resp Swallow: Medical attention immed	Resp sys, blood, liver, lymphatics, kidneys, skin, bone marrow
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	NIOSH 0.5 mg/m^3: HiE^4/SA^4/SCBA^4 1.25 mg/m^3: SA:CF^4/PAPRHiE^4 2.5 mg/m^3: HiEF/SCBAF/SAF/PAPRTHiE^4 70 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit eyes; green tongue, metal taste; irrit throat; cough; fine rales, wheez, bron, dysp; eczema	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Resp sys, skin, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	NIOSH 0.5 mg/m^3: HiE/^{4}/SA^4/SCBA^4 1.25 mg/m^3: SA:CF^4/PAPRHiE 2.5 mg/m^3: HiEF/SCBAF/SAF/PAPRTHiE^4 70 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con	Irrit eyes, green tongue, metal taste, irrit throat, cough, fine rales, wheez, bron, dysp, eczema	Breath: Art resp	Resp sys, skin, eyes

Vanadium pentoxide Fume

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Vinyl chloride C_2H_3Cl 75-01-4 KU9625000 1086 17	Chloroethylene, Chloroethene, Monochloroethylene, Ethylene monochloride, Monochloroethene, Vinyl C monomer, Trovidur, VC, Vinyl chloride monomer, VCM	1 ppm 5 ppm 15-min ceil (NIOSH) Lowest detectable limit See Appendix A (ACGIH) 5 ppm, A1a	Ca	Colorless gas; liquifies in a freezing mixture	MW: 62.5 BP: 7°F Sol: Slight Fl.P: -108°F IP: 9.995 eV	VP: 2580 mm MP: -245°F UEL: 33 LEL: 3.6	Copper oxidizing materials	NIOSH 77-157A
Vinyltoluene $CH_3C_6H_4CHCH_2$ 25013-15-4 WL5075000 2618 27	Methylstryrene, Tolyethylene; meta- and para-vinyltoluene (mixed isomers)	100 ppm (480 mg/m³) (ACGIH) 50 ppm (240 mg/m³)	5000 ppm	Colorless liquid with a strong, disagreeable odor	MW: 118 BP: 334°F Sol: 0.009% Fl.P: 127°F	VP: 1.1 mm MP: -106°F UEL: 11% LEL: 0.1%	Oxidizing agents, catalysts for vinyl polymerization, such as peroxides, strong acids, aluminum chloride	Char; CS_2; CG; III
Warfarin $C_{19}H_{16}O_4$ 81-81-2 GN4550000 3027 55	3-(alpha-Acetonyl) benzyl-4-hydroxy-coumarin, WARF compound, compound 42, coumarin	0.1 mg/m³	200 mg/m³	Colorless, odorless solid	MW: 308 BP: Decomposes Sol: Insoluble Fl.P: N.A.	VP: ? MP: 322°F UEL: ? LEL: ?	Strong oxidizers	Filter; CH_3OH; HPLC; III
Xylene (o-, m-, and p-isomers) $C_6H_4(CH_3)_2$ 1330-20-7 ZE2100000 1307 27	p-ortho-Xylene, 1,2-Dimethyl-benzene; meta-Xylene, 1,3-Dimethyl-benzene; para-Xylene, 1,4-Dimethyl-benzene	100 ppm (435 mg/m³) (NIOSH) 100 ppm 10-hr TWA 200 ppm 10-min ceil	10,000 ppm	Colorless liquid with aromatic odors (pure p-xylene is a solid at < 55°F)	MW: 106 BP: 292/282/281°F Sol: 0.00003% Fl.P: 90/84/81°F IP: 8.56/8.56/8.44 eV	VP: 7/9/9 MP: -12/-54/55°F UEL: 6/7/7% LEL: 1/1.1/1.1%	Strong oxidizers	Char; CS_2; GC; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed Provide: Eyewash, quick drench	NIOSH Ξ: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE	Inh	Weak, abdom pain, GI bleeding, hematomegaly, pal or cyan of extrem, [carc]	Breath: Art resp	Liver, CNS, blood, resp sys, lymphatic sys
Clothing: Repeat prolong Goggles: Reason prob Wash: Promptly upon contam Change: N.A. Remove: Promptly contam non-imperv	ACGIH 500 ppm: CCROV^4/SA^4/SCBA^4 1000 ppm: PAPROV^4/CCRFOV 1250 ppm: SA:CF^4 2500 ppm: GMFOV/SCBAF/SAF 5000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Con Ing	Irrit eyes, skin, upper resp; drow	Eye: Irr immed Skin: Soap flush promptly Breath: Art resp Swallow: Medical attention immed	Eyes, skin, resp sys
Clothing: Repeat prolong Goggles: N.A. Wash: Promptly upon contam Change: After work any poss contam Remove: Promptly contam non-imperv	OSHA 0.5 mg/m^3: DMXS 1 mg/m^3: DMXSQ/SA/SCBA 2.5 mg/m^3: PAPRDM/SA:CF 5 mg/m^3: HiEF/ PAPRTHiE/SCBAF/SAF/SAT:CF 100 mg/m^3: SA:PD,PP 200 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Hema, back pain, hemats arms, legs; epistaxis, bleeding lips, muc memb hemorr, abdom pain, vomit, fecal blood; petechial rash; abnormal hematology	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	Blood, CVS
Clothing: Repeat prolong Goggles: Reas prob Wash: Promptly upon contam Change: N.A. Remove: Any wet immed (flamm)	NIOSH 1000 ppm: CCROV^4/PAPROV^4/ SA^4/SCBA^4 2500 ppm: SA:CF^4 5000 ppm: GMFOV/SCBAF/SAF 10,000 ppm: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Dizz, excitement, drow, inco, staggering gait; irrit eyes, nose, throat; corneal vacuolization; anor, nau, vomit, abdom pain; derm	Eye: Irr immed Skin: Soap wash promptly Breath: Art resp Swallow: Medical attention immed	CNS, eyes, GI tract, blood, liver, kidneys, skin

Xylene (o-,m-, and p-isomers)

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Xylidine $(CH_3)_2C_6H_3NH_2$ 1300-73-8 ZE8575000 1711 55	2,4-Dimethylaniline, etc (6 isomers); Xylidine isomers; Xylidine mixed o-m-p	5 ppm (25 mg/m³) (ACGIH) 2 ppm (10 mg/m³)	150 ppm	Pale yellow to brown liquid with a weak, aromatic, amine odor	MW: 121 BP: 415 to 439°F Sol: Insoluble Fl.P: 206°F	VP: < 1 mm MP: ? UEL: ? LEL: 1.5%	Strong oxidizers, hypochlorite bleaches	SiO_2; CH_3CH_2OH; GC; L
Yttrium compounds (as Y) Y 7440-65-5 ZG2980000	Synonyms vary depending upon specific compound	1 mg/m³	N.A.	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		Yttrium nitrate; combustible materials	Filter; acid; AA; N
Zinc Chloride fume $ZnCl_2$ 7646-85-7 ZH1400000 2331 60	None	1 mg/m³	2000 mg/m³	White fume with an acrid odor	MW: 136 BP: 1350°F Sol(77°F): 81% Not combustible	VP: N.A. MP: 541°F	None hazardous	—
Zinc oxide fume ZnO 1314-13-2 ZH4810000 1436 32	Calamine	5 mg/m³ (NIOSH) 5 mg/m³ 10-hr TWA 15 mg/m³ 15-min ceil	N.A.	White fume	MW: 81 BP: Sublimes Sol: Insoluble Not combustible	VP: N.A. MP: <3272°F	Chlorinated rubber	Filter; (none); XRD; III

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Clothing: Any poss Goggles: Any poss Wash: Immed upon contam Change: N.A. Remove: Immed contam non-imperv Provide: Eyewash, quick drench	ACGIH 20 ppm: CCROV/SA/SCBA 50 ppm: SA:CF/PAPROV 100 ppm: CCRFOV/PAPRTOV/ GMFOV/SAF/SCBAF 150 ppm: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Anoxia, cyan; lung, liver, kidney damage	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	Blood, lungs, liver, kidneys, CVS
Clothing: N.A. Goggles: Any poss Wash: N.A. Change: N.A. Remove: N.A. Provide: Eyewash	OSHA 5 mg/m^3: DMXS 10 mg/m^3: DMXSQ/SA/SCBA 25 mg/m^3: PAPRDM/SA:CF 50 mg/m^3: HiEF/PAPRTHiE/ SCBAF/SAF/SAT:CF 500 mg/m^3: SA:PD,PP 1000 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit eyes; in animals: lungs, possible liver damage	Eye: Irr immed Skin: Soap wash Breath: Art resp Swallow: Medical attention immed	Eyes, lungs
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	OSHA 10 mg/m^3: DMFu[4]/SA[4]/SCBA[4] 25 mg/m^3: PAPRDMFu[4]/SA:CF[4] 50 mg/m^3: HiEF/PAPRTHiE[4]/ SCBAF/SAF 2000 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con	Conj; irrit nose, throat; cough, copious sputum, dysp, chest pain, pulm edema, bron pneu; pulm fib, cor pulmonale; fvr; cyan; tachypnea; burns skin, eyes	Breath: Art resp	Resp sys, skin, eyes
Clothing: N.A. Goggles: N.A. Wash: N.A. Change: N.A. Remove: N.A.	NIOSH 50 mg/m^3: DMFu/SA/SCBA 125 mg/m^3: PAPRHDMFu/SA:CF 250 mg/m^3: HiEF/PAPRTHiE/ SCBAF/SAF/SAT:CF 2500 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh	Sweet metal taste; dry throat, cough; chill, fever; tight chest, dysp, rales, lo pulm func; head; blur vision; back pain; nau, vomit; ftg	Breath: Art resp	Resp sys

Zinc oxide fume

Chemical Name, Formula, CAS, RTECS, and DOT UN or NA and Guide Numbers	Synonyms	Exposure Limits	IDLH Level	Physical Description	Chemical and Physical Properties		Incompatibilities	Measurement Method (See Tables 1a and 1b)
Zirconium compounds (as Zr) Zr 7440-67-7 ZH7070000	Synonyms vary depending upon specific compounds	5 mg/m³	500 mg/m³	Appearance and odor vary depending upon specific compound	Properties vary depending upon specific compound		ZrCl: water, moist air, alkali metals; ZrH_2: strong oxidizers	Filter; acid; AA; M
*Dibromochloropropane $C_3H_5Br_2Cl$ 96-12-8 TX8750000 2872	1-Chloro-2,3-dibromopropane, DBCP, 1,2-Dibromo-3-chloropropane	1 ppb (NIOSH) 10 ppb (0.1 mg/m³) 10-hr TWA	Ca	Dense yellow or amber liquid with a pungent odor at high concentrations. May also appear in granular form	MW: 236.35 BP: 383°F Sol: 0.1% Fl.P: 170°(oc)	VP: 0.8 mm MP: 43°F UEL: N.A. LEL: N.A.	Chemically active metals: aluminum, magnesium, tin and alloys; attacks some rubber and coatings	Char(pet); GC; —

Personal Protection and Sanitation (See Table 2)	Respirator Selection Upper Limit Devices Recommended (See Table 3)	Health Hazards			
		Route	Symptoms (See Table 4)	First Aid (See Table 5)	Target Organs
Recommendations vary depending upon specific compounds	25 mg/m^3: DMXS 50 mg/m^3: DMXSQ/SA/SCBA 125 mg/m^3: PAPRDM/SA:CF 250 mg/m^3: HiEF/PAPRTHIE/ SCBAF/SAF/SAT:CF 500 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con	Skin granulomas	Eye: Irr immed Skin: Soap wash Breath: Art resp Swallow: Medical attention immed	Resp sys, skin
*Clothing: Any poss Goggles: Any poss Wash: Immed upon contam/daily Change: After work if any poss contam Remove: Any contam immed	NIOSH Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFHiEOV/SCBAE	Inh Abs Con	Drow, nau, vomit; irrit eyes, nose, throat, skin; pulm edema	Eye: Irr immed Skin: Soap wash immed Breath: Art resp Swallow: Medical attention immed	CNS, skin, liver, kidney, spleen, reproductive sys, digestive sys

Dibromochloropropane

APPENDICES

APPENDIX A—NIOSH OCCUPATIONAL CARCINOGENS

NIOSH has identified numerous chemicals that should be treated as occupational carcinogens even though OSHA has not identified them as such. In determining their carcinogenicity, NIOSH uses a classification outlined in 29 CFR 1990.103 which, in part, states:

> " 'Potential occupational carcinogen' means any substance, or combination or mixture of substances, which causes an increased incidence of benign and/or malignant neoplasms, or a substantial decrease in the latency period between exposure and onset of neoplasms in humans or in one or more experimental mammalian species as the result of any oral, respiratory or dermal exposure, or any other exposure which results in the induction of tumors at a site other than the site of administration. This definition also includes any substance which is metabolized into one or more potential occupational carcinogens by mammals."

NIOSH has not identified thresholds for carcinogens that will protect 100% of the population. To ensure maximal protection through the use of respiratory protection, only the most reliable and protective respirators are recommended. These include: a self-contained breathing apparatus with a full facepiece operated in positive-pressure mode, or a supplied-air respirator with a full facepiece operated in pressure-demand or other positive-pressure mode in combination, with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

APPENDIX B—SUPPLEMENTARY RESPIRATOR SELECTION TABLES

Carbon black

NIOSH
17.5 mg/m^3: DM
35 mg/m^3: DMXSQ/SA/SCBA
87.5 mg/m^3: PAPRDM/SA:CF
175 mg/m^3: HiEF/PAPRTHiE/
SCBAF/SAF
3500 mg/m^3: SA:PD,PP
Ω: SCBAF:PD,PP/SAF:PD,PP:ASCBA
Escape: HiEF/SCBAE

IN PRESENCE OF POLYCYCLIC
AROMATIC HYDROCARBONS

NIOSH
Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA
Escape: HiEF/SCBAE

Chromium metal and insoluble salts (as Cr)

CARCINOGENIC Cr (VI)

NIOSH
Ξ: SCBAF:PD,PP/SAF:PD,PP:ASCBA
Escape: HiEF/SCBAE

NONCARCINOGENIC Cr (VI)

0.25 mg/m^3: SA$^{\blacktriangle}$/SCBA$^{\blacktriangle}$/DMXSQ$^{\blacktriangle}$
0.625 mg/m^3: PAPRHiE$^{\blacktriangle}$/SA:CF$^{\blacktriangle}$
1.25 mg/m^3: HiEF/PAPRTHiE$^{\blacktriangle}$/
SCBAF/SAF
25 mg/m^3: SA:PD,PP
50 mg/m^3: SAF:PD,PP
Ω: SCBAF:PD,PP/
SAF:PD,PP:ASCBA
Escape: HiEF/SCBAE

Mercury and inorganic compounds (as Hg)

Inorganic Mercury Compounds with essentially no vapor pressure

NIOSH
0.5 mg/m^3: HiE/SA/SCBA
1.25 mg/m^3: SA:CF/PAPRHiE
2.5 mg/m^3: SAF/SCBAF/HiEF/
PAPRTHiE/SAT:CF
28 mg/m^3: SA:PD,PP
Ω: SCBAF:PD,PP/
SAF:PD,PP:ASCBA
Escape: HiEF/SCBAE

APPENDIX B—SUPPLEMENTARY RESPIRATOR SELECTION TABLES (Continued)

Mercury (elemental)	NIOSH 0.5 mg/m^3: CCRS®/SA/SCBA 1.25 mg/m^3: SA:CF/PAPRS® (canister) PAPRS® (canister) 2.5 mg/m^3: SAF/SCBAF/SAT:CF CCRFS®/GMFS®/PAPRTS (canister) 28 mg/m^3: SA:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFS/SCBAE
Uranium, soluble compounds (as U)	OSHA 0.5 mg/m^3: HiE/SA/SCBA (for halides) CCRAGHiE 1.25 mg/m^3: SA:CF/ PAPRHiE (not for halides)/ PAPRDMAG (for halides) 2.5 mg/m^3: SAF/SCBAF/HiEF (not for halides)/CCRAGFHiE (for halides)/GMFHiEAG (for halides) PAPRTHiE (not for halides)/PAPRTAGHiE (for halides)/SAT:CF 20 mg/m^3: SAF:PD,PP Ω: SCBAF:PD,PP/ SAF:PD,PP:ASCBA Escape: GMFHiEAG (for halides)/ HiEF (not for halides)/SCBAE

APPENDIX C—THIRTEEN OSHA REGULATED CARCINOGENS

OSHA has promulgated standards to regulate the industrial use of thirteen chemicals (2-acetylaminofluorene, alpha-naphthylamine, 4-aminodiphenyl, benzidine, beta-naphthylamine, beta-propiolactone, bis-chloromethyl ether, 3,3-dichlorobenzidine, 4-dimethylaminoazobenzene, ethyleneimine, methyl chloromethyl ether, n-nitrosodimethylamine, and 4-nitrobiphyenyl) identified as occupational carcinogens without establishing permissible exposure limits. Workers' exposure to these thirteen chemicals are to be controlled through the required use of engineering controls, work practices, and personal protective equipment, including respirators. Details of these requirements can be found in 29 CFR 1910.1003-1910.1016.

Respirator selections are based on NIOSH policy which considers the thirteen chemicals to be potential human carcinogens in the workplace.

APPENDIX D—SUPPLEMENTARY EXPOSURE LIMITS

Asbestos

The effective date for the current OSHA standard for asbestos was July 1, 1976. The 8-hour TWA airborne concentration of asbestos fibers to which any worker may be exposed shall not exceed two fibers, longer than 5 micrometers, per cubic centimeter of air (2 fibers/cc), as determined by the membrane filter method at 400-450X magnification (4-mm objective) with phase contrast illumination. No worker shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers, longer than 5 micrometers, per cubic centimeter of air (10 fibers/cc).

NIOSH considers asbestos a carcinogen (Ca); the NIOSH-recommended 8-hour TWA exposure limit for asbestos fibers >5 micrometers in length is 100,000 fibers/m^3 (0.1 fiber/cc), utilizing a 400 liter air sample, and the NIOSH Analytical Method 7400.

ACGIH designates asbestos as a human carcinogen (A1a) with an assigned TLV for: amosite, 0.5 fiber>5 μm/cc; chrysotile, 2 fibers>5 μm/cc; crocidolite, 0.2 fiber>5 μm/cc; and other forms, 2 fibers>5 μm/cc, as determined by the membrane filter method at 400-450X magnification (4-mm objective) phase contrast illumination.

Chromic Acid and Chromates
Chromium, Metal and Insoluble Salts
Chromium, Soluble Chromic, Chromous Salts

The OSHA PEL's are as follows: chromic acid and chromates (as CrO_3), 0.1 mg/m³ (ceiling); chromium, metal and insoluble salts (as Cr), 1 mg/m³ (8-hour TWA); and chromium, soluble chromic, chromous salts (as Cr), 0.5 mg/m³ (8-hour TWA).

The NIOSH recommended exposure limit for carcinogenic chromium (VI) compounds is 1 µg Cr (VI)/m³ (10-hour TWA). For noncarcinogenic chromium (VI) compounds (which includes chromic acid), NIOSH recommends a 25 µg Cr (VI)/m³ 10-hour TWA and a 50 µg Cr (VI)/m³ 15-minute ceiling. Based on current evidence, noncarcinogenic chromium (VI). . . is the chromium (VI) in monochromates and bichromates (dichromates) of hydrogen, lithium, sodium, potassium, rubidium, cesium, ammonia, and chromic (VI) oxide (chromic acid anhydride). Carcinogenic chromium (VI) comprises any and all chromium (VI) materials not included in the noncarcinogenic group above.

ACGIH has three different TLV's for chromium metal and inorganic compounds (all as Cr). The 8-hour TWA for chromium metals and alloys; chromium (II) compounds (e.g., chromous chloride and chromous sulfate); and chromium (III) compounds (e.g., chromic oxide, chromic sulfate, chromic chloride, chromic potassium sulfate, and chromite ore) is 0.5 mg/m³. The 8-hour TWA for water-soluble chromium (VI) compounds which include chromic acid and its anhydride, and the monochromates and dichromates of sodium, potassium, ammonium, lithium, cesium, and rubidium is 0.05 mg/m³. The 8-hour TWA for certain water-insoluble chromium (VI) compounds, which include zinc chromate, calcium chromate, lead chromate, barium chromate, strontium chromate, and sintered chromium trioxide, and chromite ore processing (chromate) is 0.05 mg/m³ with a designation A1a (human carcinogen).

APPENDIX D—SUPPLEMENTARY EXPOSURE LIMITS (Continued)

Coal Tar Pitch Volatiles

The current OSHA PEL for coal tar pitch volatiles (anthracene, BaP, phenanthrene, acridine, chrysene, pyrene) is 0.2 mg/m³ benzene-soluble fraction (8-hour TWA).

NIOSH considers coal tar products to be carcinogenic (Ca); the NIOSH-recommended 10-hour TWA exposure limit for coal tar products is 0.1 mg/m³ (cyclohexane-extractable fraction).

ACGIH designates coal tar pitch volatiles as a human carcinogen (A1a) with an 8-hour TWA of 0.2 mg/m³ (benzene-solubles).

Cotton Dust (raw)

The current Federal standard for cotton dust was promulgated by OSHA on June 23, 1978 and is 200 μg/m³ (mean concentration) in textile yarn manufacturing, 750 μg/m³ (mean concentration) in textile slashing and weaving operations, and 500 μg/m³ (mean concentration) in all other operations. This standard does not apply to the harvesting of cotton, cotton ginning, and the handling and processing of woven or knitted materials and washed cotton. These concentrations are for samples averaged over an 8-hour period collected by the vertical elutriator or equivalent method.

The NIOSH-recommended 10-hour TWA exposure limit for cotton dust is 200 μg/m³ (lint-free cotton dust).

The ACGIH TLV for cotton dust (raw) is 200 μg/m³ (lint-free dust) as measured by the vertical elutriator cotton-dust sampler (8-hour TWA).

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